

NATURE

Through the Year



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THE SEASONS

HAWAB SALAH JUNG EASLETON

IT is in winter, perhaps, that the English countryman is most aware that he lives on an island, for the sea-gulls fly far inland to hover over his fields and follow his plough. Their narrow white wings, with their great spread, bring life and movement to the dark fields as they weave restlessly to and fro. Swooping low, white against the black earth, or high against a storm cloud, they symbolize the stormy beauty of our island winter. For some reason, the presence of the sea seems necessary to evoke their plaintive cry, for one seldom hears their voice inland.

Even shy birds, that have most reason to fear man, are reassured when they see him with horses. Rooks, for instance, that fly away as soon as a man carrying a gun comes into a field where they are, will crowd close about his heels as he walks, following his plough in the open furrow; strangely enough, the noisy tractor has the same effect, and one day early in November the driver, looking back at his plough, will be startled by a great white bird sliding down the wind behind him almost within reach of his arm—the first sea-gull of winter.

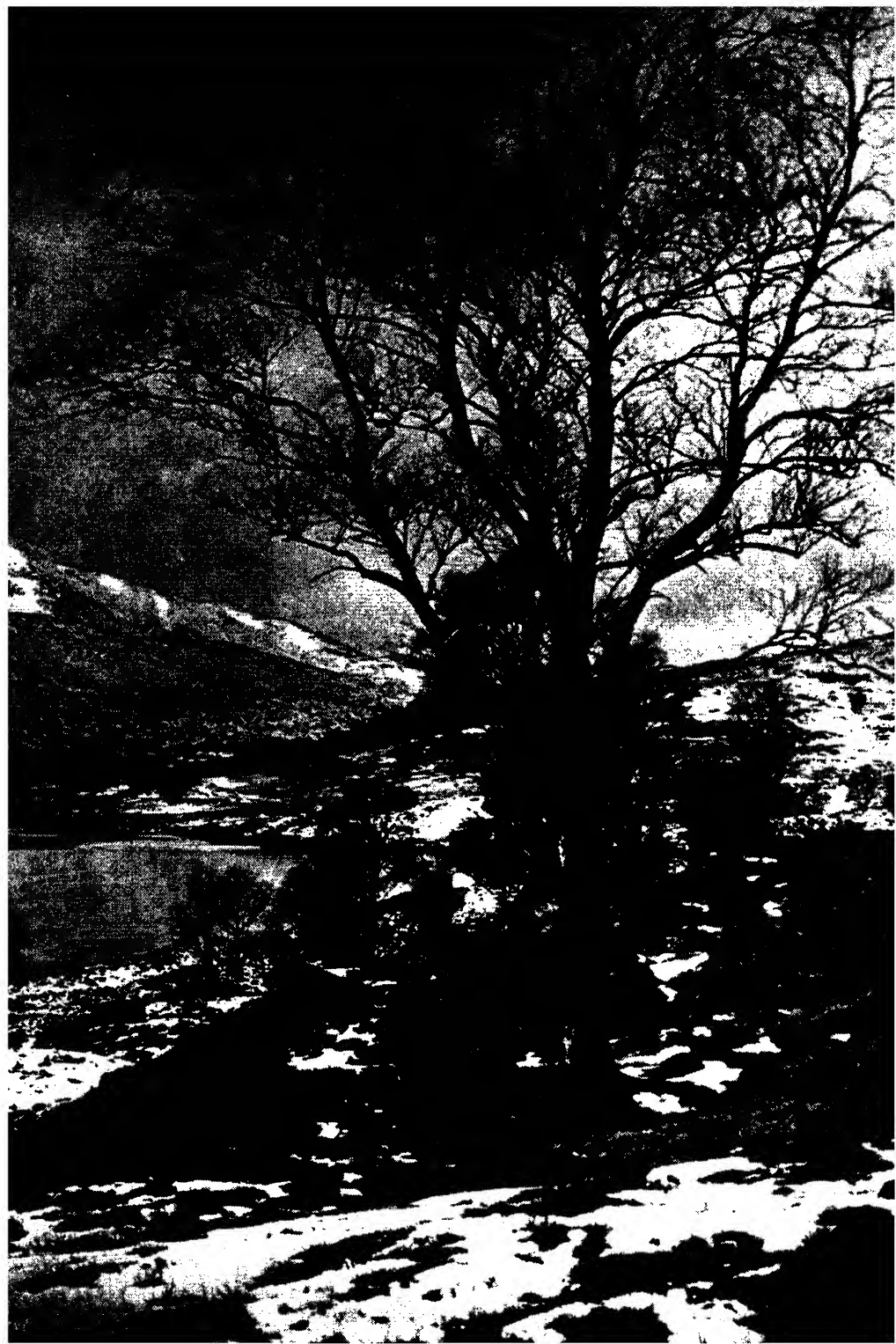
Winter is a season of beauty for the husbandman: he has time to stand and

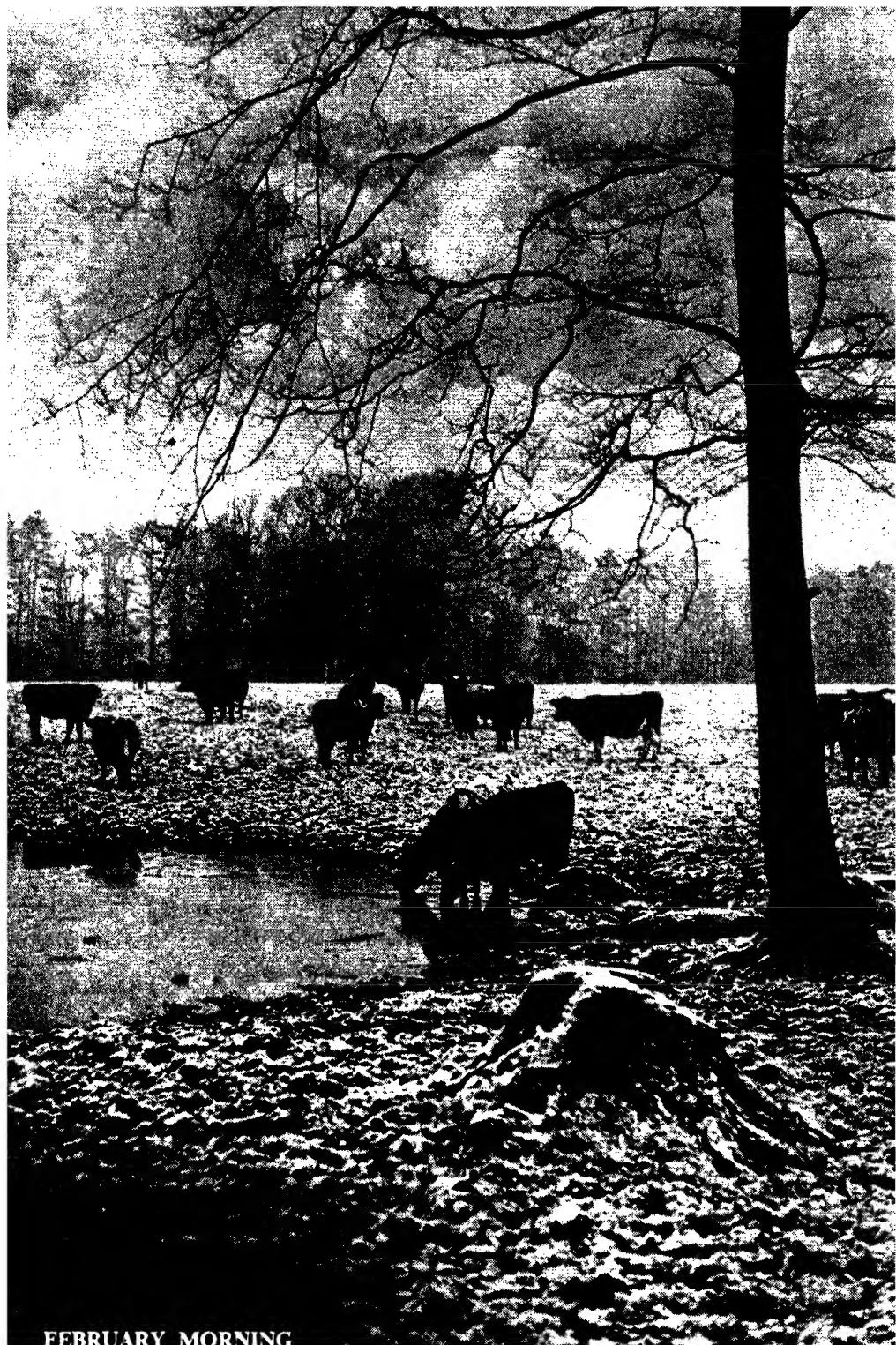
stare; and there is much worth staring at in the commonest view. For the complete countryman—the man whose life and work is the land—winter has a double joy. He can walk among woods and hedgerows which he is often too busy to see in their spring attire, noting the shapes of boughs and coppice wood and the tall straight trunks of young oaks. Even if he comes with a gun under his arm, and thinks more in terms of gateposts, bean-poles and faggots than consciously of beauty, a bolting rabbit may still find him unprepared, and he cannot fail to be refreshed by something more than mere usefulness in the scene. Sometimes a flock of lapwings passes overhead, flying roughly in V formation as geese do, flickering black and white against the sky. Catkins of the hazel already make a tenuous swinging curtain, and on a day of sunshine and breeze, the polished ivy leaves flash like diamonds. "If a cow won't eat ivy she won't eat anything", is a country saying; and you may often see cows (and horses) tearing it from tree trunks, or from a hedge whence a growth of brambles has been cleared, making it accessible to them.

Where there is more land under the



THE PEACE OF WINTER - GLEN GARRY





FEBRUARY MORNING

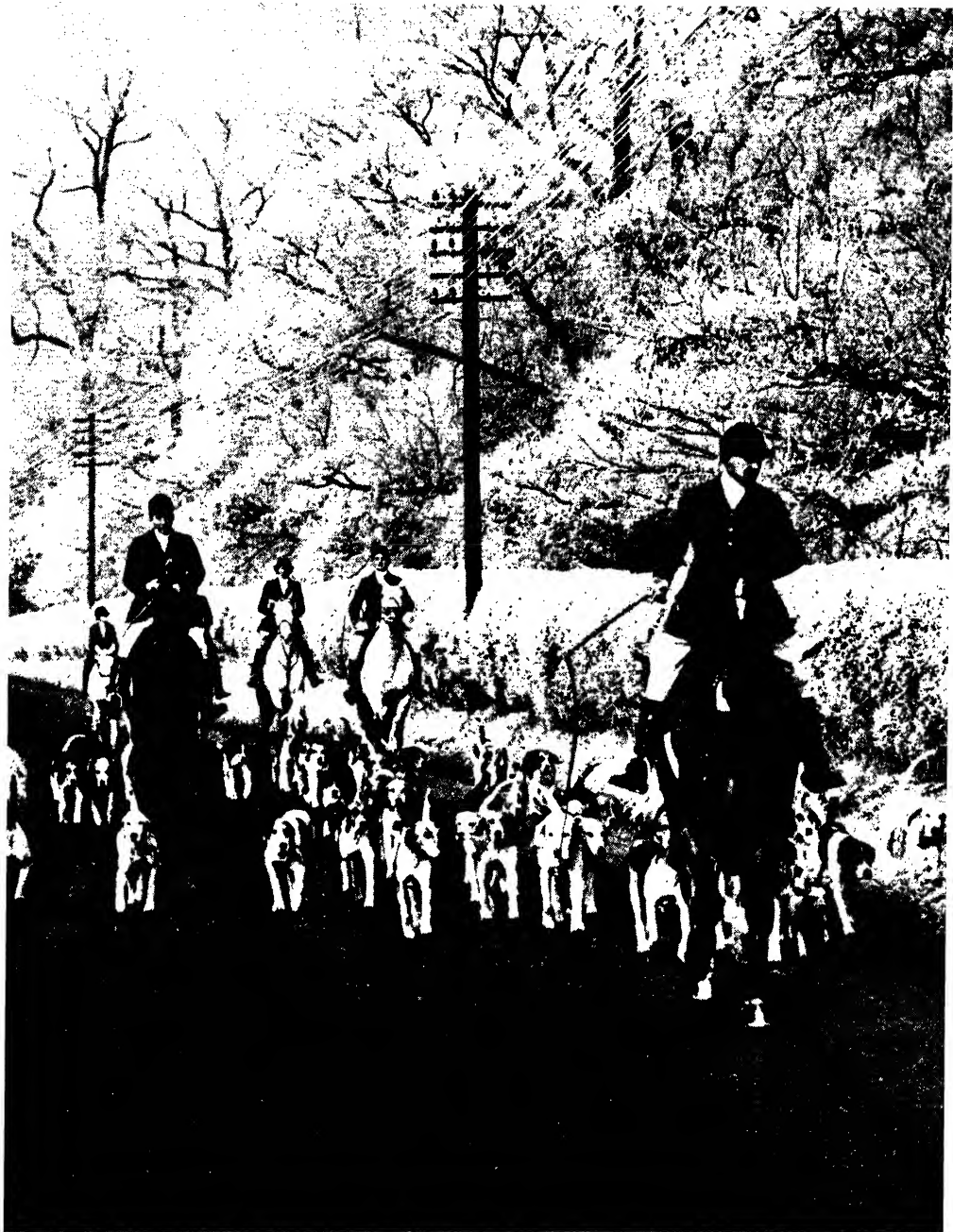
plough than usual, particularly noticeable is the green of the young autumn-sown corn; this is a most unwintery hue, and can only be described as brilliant in contrast to the bare trees casting their shadows in a fine dark network over the expanse. Such clarity of colour makes winter grass look not green at all, but a dull greyish brown; and we wonder what colour there was in winter before the coming of the corn. In the next field, which is ploughed and bare, a covey of partridges, fifteen of them, only become apparent as they move across the furrows, for as soon as they grow still they are invisible. Not so the cock pheasant, who struts glittering in the wood, like an admiral or general of former days exposed to the enemy in all his finery—he proclaims himself for what he is, a foreign bird.

One of the beauties of winter lies in the beauty of ploughing. It was an

inveterate townsman who said that one field is exactly like another—he might have been forgiven if he had said that one *ploughed* field is exactly like another—but even there he would have been wrong. A countryman never grows tired of looking at furrows for some fields are ploughed in wide “lands” and some in narrow and if you walk over meadows you will often notice that they are in wavy ribs, up and down. One used to love running across such a field as a child, for the switch-back motion it gave. Such meadows were once ploughed, and the land being wet and heavy, they were ploughed in what is called “ten-furrow work”; that is to say ten furrows and then a wide open furrow to take off the water. This ten-furrow work when neatly done, is a beautiful sight: the field is left patterned with the frequent bold strokes of the open furrows. There are several kinds of furrows; upstanding

SPARROWS IN WINTER. *Probably the house sparrow is the most common and well known bird in this country, and can be found at all times of the year quarrelling noisily outside dwellings and frequently even in the very heart of our great cities.*





WITH HIS HORSE AND HIS HOUNDS IN THE MORNING. *On a frosty winter's morning the South Oxfordshire Hunt move from the Kennels to the place of the meet. The master is accompanied by his huntsman and whippers-in. Packs of foxhounds vary considerably in size according to the districts in which they hunt.*

crested furrows, and flat inverted ones; some fields have been ploughed by tractor, and some with horses, and can you tell which? There are awkward corners and ponds and other impediments skilfully negotiated; in fact, ploughed fields are as superficially alike and in reality as unlike as the faces of his flock are to a shepherd and that is why a countryman never grows bored on a winter journey. It is he who keeps rubbing the vapour off the railway-carriage window-pane when the other passengers are reading or asleep.

There is rest in the thought of winter to the countryman for he who is active when nature is active can enjoy the sense of repose which the sight of the dormant earth gives. There is too, the uncertainty of the season, which gives an English winter an individuality of its own—one has only to think of the two traditional winter pastimes of skating and hunting to realize this. Jorrocks and his hounds: Mr. Pickwick on the ice: both are typically English, yet mutually incompatible, since their individual settings require different kinds of weather.

A Mirage of Spring

We never know if frost and snow will come to muffle the landscape out of recognition, or whether we shall be picking roses at Christmas and primroses in January, and listening to robins, wrens and thrushes. Sometimes winter becomes a mirage of spring, till the unseasonable becomes seasonable, and we glide into blossom-time with hardly a chilblain for memory. In the mountainous parts of Britain, however, they are sure of snow on the peaks at least. There the first snow on the Fells is a sight to be remembered. All summer the farmer of Westmorland or Cumberland lives in his valley, with the line of the Fells shutting him in from the world like a giant fortification covered in grass of a

nondescript, greyish colour. Suddenly, one morning, he wakes to find the mountains have become dazzling white. The rising sun, as he watches, turns them pink; their rugged mass grows delicate and fairylike, rising out of the lowland vista which still is lush and green.

But whatever the weather, spring pushes secretly forward and spring blossoms do not wait for there is some rhythm which growing things have, unperceived by us. Cold may retard their unfolding, but it cannot prevent it. The aconite often bears snow-crystals on the green ruff under its yellow bud, as it comes pushing up from below.

Lovely April

It is difficult to conceive of anything more lovely than the English spring, and this is no poetic exaggeration, but literal truth. For evidence of it we have the testimony of the poets. If springtime is beautiful anywhere, surely it should be in Italy; yet, there, Browning in April, sighed for England. A blackbird scattering dewdrops on a clover-field—the elm bole “in tiny leaf”, meant more to him than the profuse riches of a Mediterranean spring. One of our best and best-known writers on nature, Sir William Beach-Thomas, has made an interesting comparison between spring in Majorca, Madeira and England, where he successively experienced it in the same year. Long before we in England could hope for more than an occasional primrose, he describes how in Majorca the hoopoe stands among scattered almond-blossoms, while all around bloom fields of asphodel. Anemones abound—not our frail wind-flowers that hide their heads—but bold ones, in all their rich florists’ colours. Returning to England (it was still only March), he heard a chaffinch sing from an apple-tree; “then”, he says, “I was quite sure that England was the Fortunate Isle for me”.





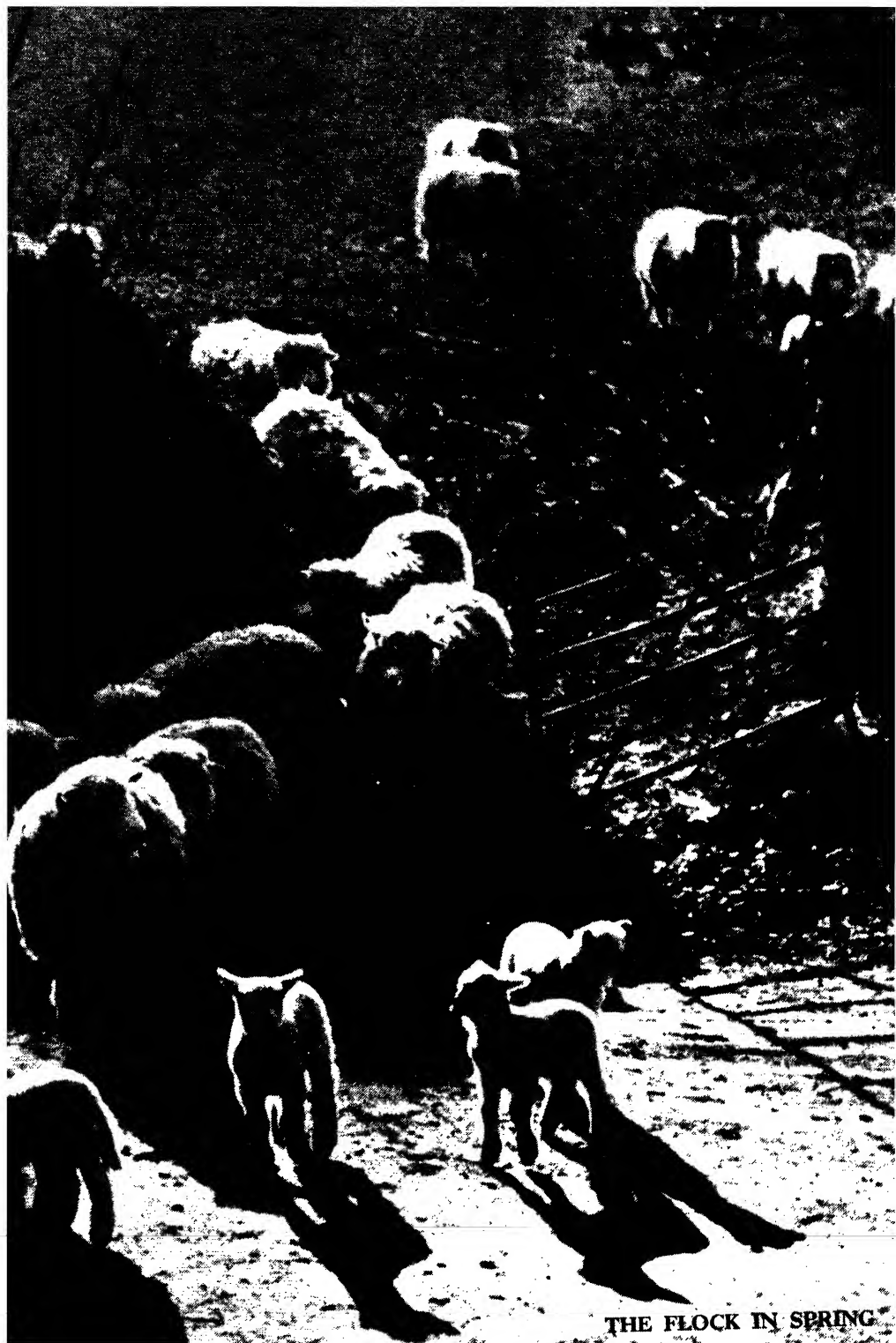
EARLY SPRING SUNSHINE. *The graceful dignity of these beech trees is emphasized to advantage by sunlight and reflection.*

The wonder of England's spring is its defiance of storms—the shy violet, the peeping primrose, knotty old fruit-wood putting forth star-like flowers. It does not parade itself like Browning's "gaudy melon flower", but must be sought and discovered. Bluebells hide in woods; primroses lurk in common ditches; violets seem to take a pleasure in burying themselves in grass, our spring is a thing of gleams and moments, of intervals of sunshine glittering between storms—it is in fact a journey of discovery. Even if you do not actually travel very far; even if you merely pass to and fro over the same mile of road between home and work, every day brings to notice some new flower in field or hedgerow. A poplar tree putting on its leaves with the sun shining through, can become a thing of more than earthly cheer in a workaday existence.

Spring Pilgrimages

Spring was a season when our ancestors used to go on pilgrimages; and this restlessness, this desire to "do something about it", is very natural in a people who are at heart both poets and men of action. Men like Lovelace, Sir Philip Sidney and Raleigh, could pen the most delicate verse and prose but this did not stop them from adventurous discoveries and bloody battles. The gift of rejoicing in little things is also an English trait, and has been with us since Chaucer immortalized the daisy. Without question the spirit of the English spring is rare and elusive but it has undoubtedly been captured for ever by our great poets. There is Wordsworth's celandine, Keats's "coming musk-rose", Shakespeare's daffodils "that take the winds of March with beauty"—even a piece of





THE FLOCK IN SPRING





APRIL DAFFODILS. *The first bright blaze of spring is seen in the daffodil which grows in profusion in many localities.*

ordinary observation like Tennyson's "black as ash-buds in March" becomes poetry, for perhaps we had not noticed before how black ash-buds are in March.

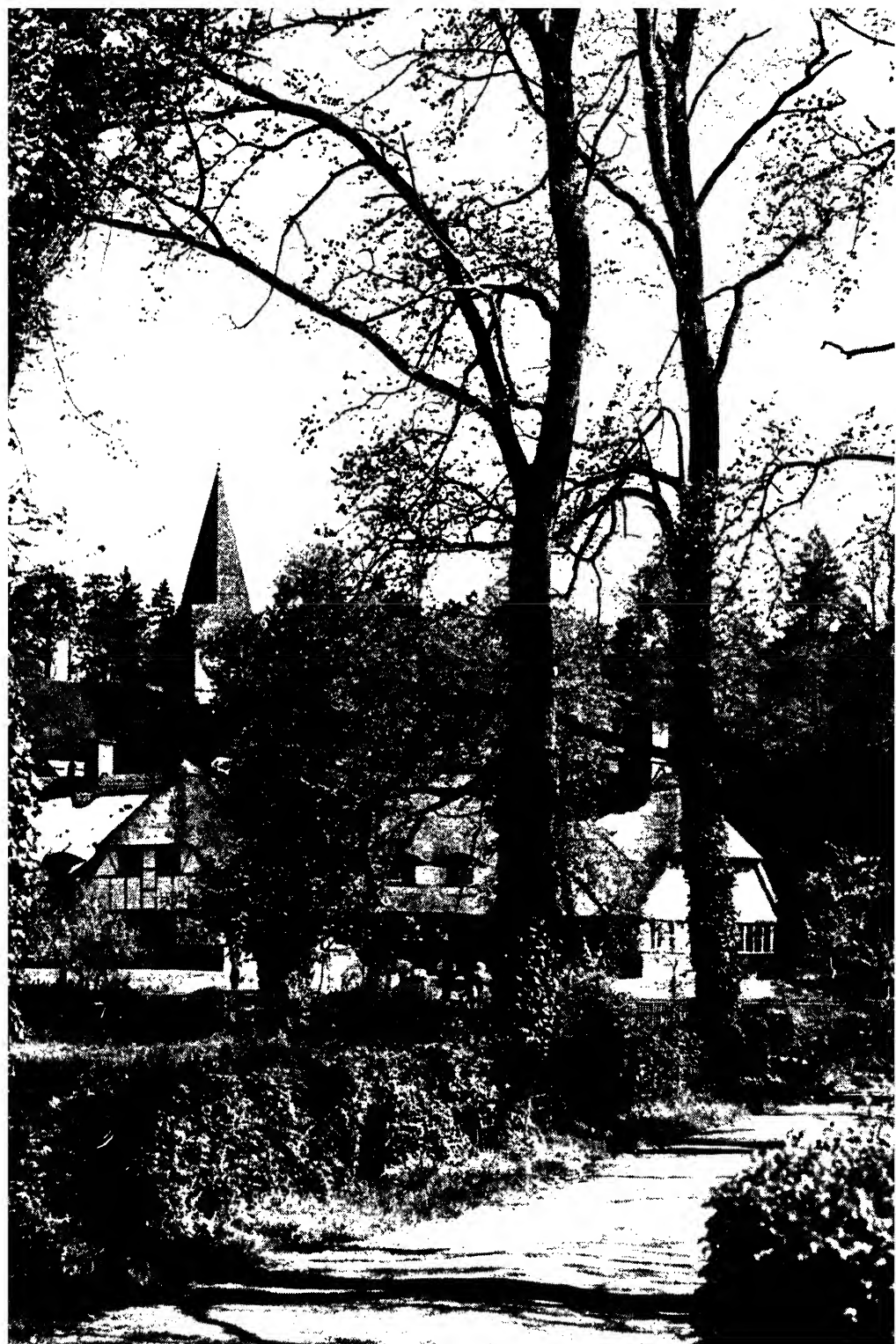
Probably all of us still have our little pilgrimages in spring even if we only walk round our gardens, they are a world which we discover afresh; and yet, curiously enough, an English spring is announced by that foreigner from overseas, the cuckoo, to be followed in May by the swallow from Africa. Yet who could imagine April without the cuckoo, or May without the swallow?

As soon as they arrive in this country swifts and swallows may be seen swooping low over water and level meadows catching the small flying insects that hatch out in such places.

When you come to think of it, it is miraculous that so many tiny insects or their embryos survive the winter's frosts, for nature both brings the killing frost and yet manages to protect her smallest creatures from its rigours.

The chorus of bird song swells to a crescendo, before being hushed by the warmer days which bring with them domestic responsibilities and the anxious work of feeding the young nestlings. Throughout May, wherever there is a wild thicket of hawthorns, the nightingale can be heard singir g his beautiful, tireless song.

But the blackbird has perhaps the clearest melody of any British bird, with the thrush a close second, while willow-warbler and tiny wren have sudden trills which one associates with summer breezes and early dew. Maybe that is because the song of the willow warbler always seems to be borne to one on a gust that scatters apple-blossoms, and the wren sings piercingly sweet out of





BEECH TREES IN EARLY SUMMER. *The lovely pale green foliage of the beech in the late spring and early summer casts a hundred shadows and reflections on the rich carpet of young ferns and bluebells which shelter under their branches.*

an early morning thicket. But what of the rook? He cries "Maud, Maud" in a gruff and untuneful voice, and yet we love to hear the chorus of rooks in March, as they swirl around the high elms of their rookery before setting out across the fields. They are associated in our thoughts with spring and autumn, with March winds and November gales, that blow their companies across the sky like so many black tatters from some old garment. They almost come to symbolize the seasons of sowing, though we do not know for certain whether to regard them as friends or enemies; if they are not actually engaged in stealing our corn, however, we feel an affection for them and their raucous voices. If we had to choose between the rook and the nightingale, should we not miss that harsh voiced, and shiny coated black bird the more from our countryside?

The rook is the bird of agricultural landscapes but not the nightingale, he likes low, tangled, bowery places and the very fact of his presence usually means that here is a stretch of uncultivated ground or tangled undergrowth that offers sanctuary from human interruption. Perhaps, as our waste grounds become reclaimed, and heaths planted with rye and sugar-beet, the nightingales will be driven further west, and we shall hear report of them beyond the Severn.

The Advance of Summer

The birds of spring seem to efface themselves as summer advances, they retire into the rich thickets made by the leaves. Sparrows, though, remain much in evidence: they are the irrepressible urchins of the fields; if they have domestic cares they appear singularly little incommoded by them, and sport and



RACKEN-COVERED GLADE
IN HERTFORDSHIRE

fight and chatter all along the dusty hedges and in the standing wheat.

Corn takes pride of place as summer advances and as the grain swells and hardens, the ear grows heavy; much heavier, actually, than the stalk which bears it up three or four feet above the ground. This would seem to be a sort of balancing trick, but for the fact that the wheat can survive quite a considerable amount of wind and rain without going down. If you watch the torsion which a field of ripening wheat undergoes in a summer gale, you realize that behind the lovely swirling motion of those acres there must be a powerful resilience. The secret lies in the structure of the corn-stalk: it is tubular. Nature knew all our engineering secrets acons ago, and adopted the tubular frame where it was most needed.

Full Summer

The tale of an English summer is a tale of corn and fruit. Grass, as grass, belongs more to the spring; it is then that it focuses the attention of the countryman. Though it may here be remarked that the one colour that seems *not* to predominate in our meadows is green! After their grey frost-bitten aspect of winter, no sooner do the young blades begin to make a verdant show than it is overlaid by the dazzling white of daisies; when the daisies are past their prime, their place is taken by the yellow buttercups. Let us for a moment consider the buttercup. Must we deduce from its name that our ancestors were sentimentalists, and not realistic farmers? For the buttercup is a bitter herb and unacceptable to cows: it is, in fact, in the mass about the worst thing for butter, and in reality merits much more its other name of creeping crowfoot. "Meadows rich with buttercups" is a tempting cliché of early summer, as you gaze across an expanse of parkland, with oaks in young leaf and a golden sea of

buttercups below in which cows with their heads down, are feeding. Yet, if we could eradicate the buttercup, how much better our pastures would be.

By the time the blaze of buttercups and dandelions is moderated, the grass which they overlaid has lost its first freshness, and if a spell of dry weather intervenes it becomes positively brown; summer's verdure is more the green of foliage and corn than of grass.

The Growing Corn

As the blades of corn grow and bend over, letting the light strike their polished surfaces they take on a watery shimmer, but when the stalk begins to appear, this green changes and by the time the ear emerges, it is almost blue.

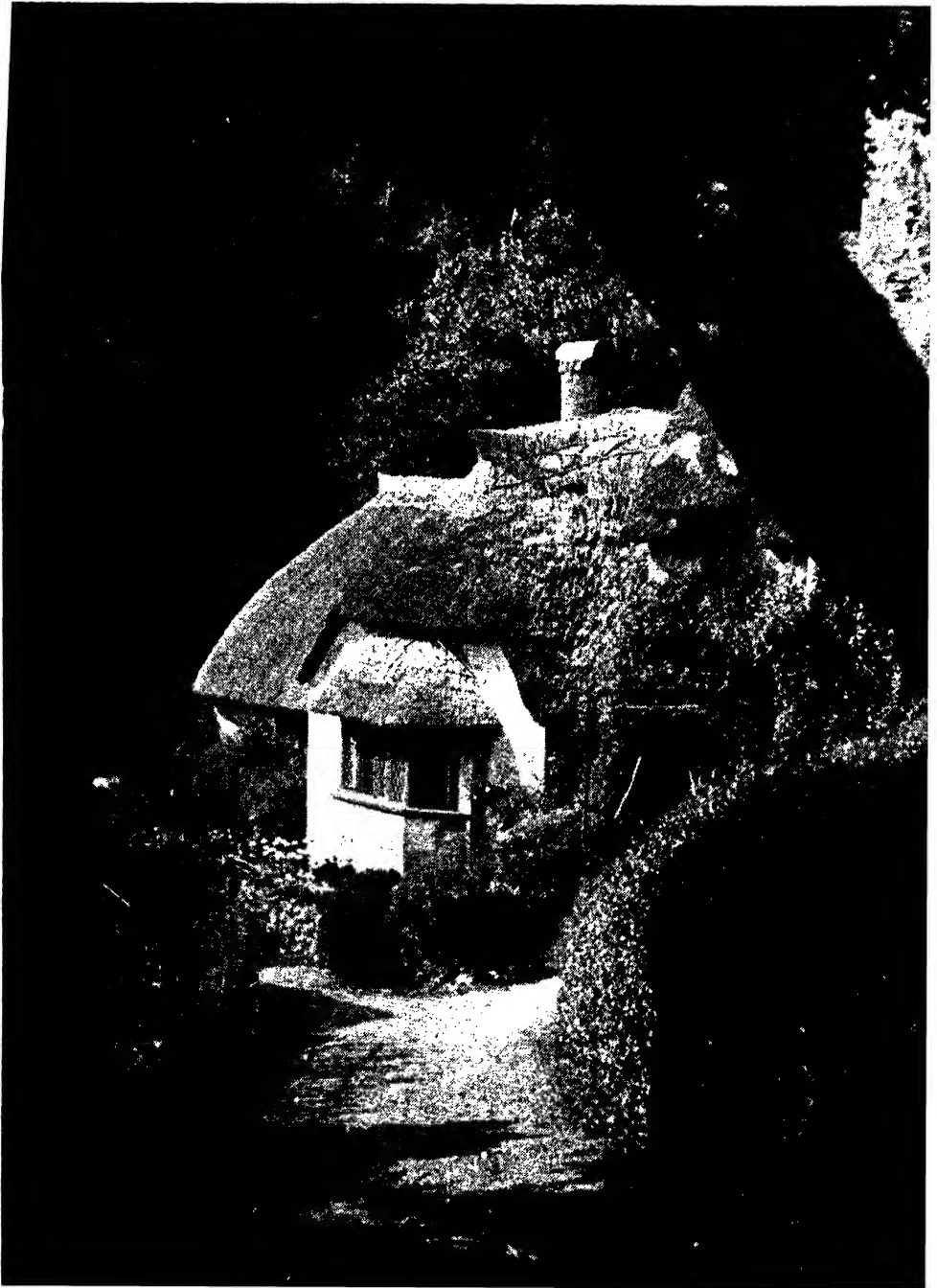
The fruit also now reddened by the sun is beginning to show among the foliage of the apple trees. Despite Cobbett's carnivorous contempt of the apple as only good for "fits of the belly-ache", we English are apple-lovers, apple-growers, apple connoisseurs; we eat the apple and we drink the apple: we make proverbs of the apple. The whole craft of apples from the grafting of the slip to the late autumnal rites of the cider-press is poetry in action, and English poetry at that for the apple has a miniature wild rose for blossom, and the rose is England's flower. In our national life, perforce urbanized, there is no longer that universal understanding of nature and husbandry that once we boasted. You can still prove, however, that the Englishman is a countryman at heart by starting the subject of apples among any representative group. Nearly everyone has a garden, however small, and in that garden at least one or two apple trees. By these and their fruits they judge the seasons, the severity of winter, the beauty of spring, the beneficence of summer and autumn. And if every man has in his own right his apple tree and



SUMMER

of a cloud SHADOWS. One of the most fascinating of nature's colour schemes is that disappear shadow. As the cloud passes over the sun the yellow and green in a landscape the and fleeting blue shadows race across the sunlit fields, changing instantly bright warm colours of a summer's day into a cool and restful scene.

THE COUNTRYMAN'S HOME ON A SUMMER'S EVENING. *England's thatched cottages with their brightly flowering gardens are one of the country's most charming possessions. Thatch is the perfect roofing for these little houses for it keeps out the heat in the summer leaving the rooms below cool and comfortable to live in.*





THE GLORY OF JULY. *The incessant movement of the bees, butterflies and moths that abound in stretches of heathland, add yet more colour to the swaying haze of pink and purple heathers. A lovely summer scene to delight the traveller.*

the land around it, then indeed "none shall make him afraid".

This is indeed the "sweet o' the year", when the corn stands high in the fields, and the unmown meadows bear the delicate beauty of wild flowers among their seeding grass-heads. If you stir the long grass, moths take flight out of it, grey like the grey heads of the grasses. Foliage makes each cottage garden a green and private bower, walled and roofed with leaves. How true and homely a touch was that of Shakespeare's in his beautiful lyric of summer, which he put characteristically into the mouth of a vagabond, Autolycus.

"The white sheet bleaching on the hedge.

"With heigh! the sweet birds. O, how they sing!"

Such simple words as might make poets of us all—or at least give us all leave to be poets. In two lines are packed the whole of England's village summer. The white sheet bleaching on the hedge is a sort of domestic flowering; the scene would be incomplete without it: it puts one in mind also of old lace curtains hung over the gooseberry bushes whose swelling fruits tempt the birds—the sweet birds—O how they sing!

For a week or two, when summer has mounted to its zenith, it seems to pause in conscious fulfilment: the wheat ear on its tenuous stalk a pendulum to the lightest air, the mowing meadows a high tide of grass, and the hedgerow oaks a deep dark green in contrast to the whitening fields. The hedges themselves are already hung with bryony berries, and the haws

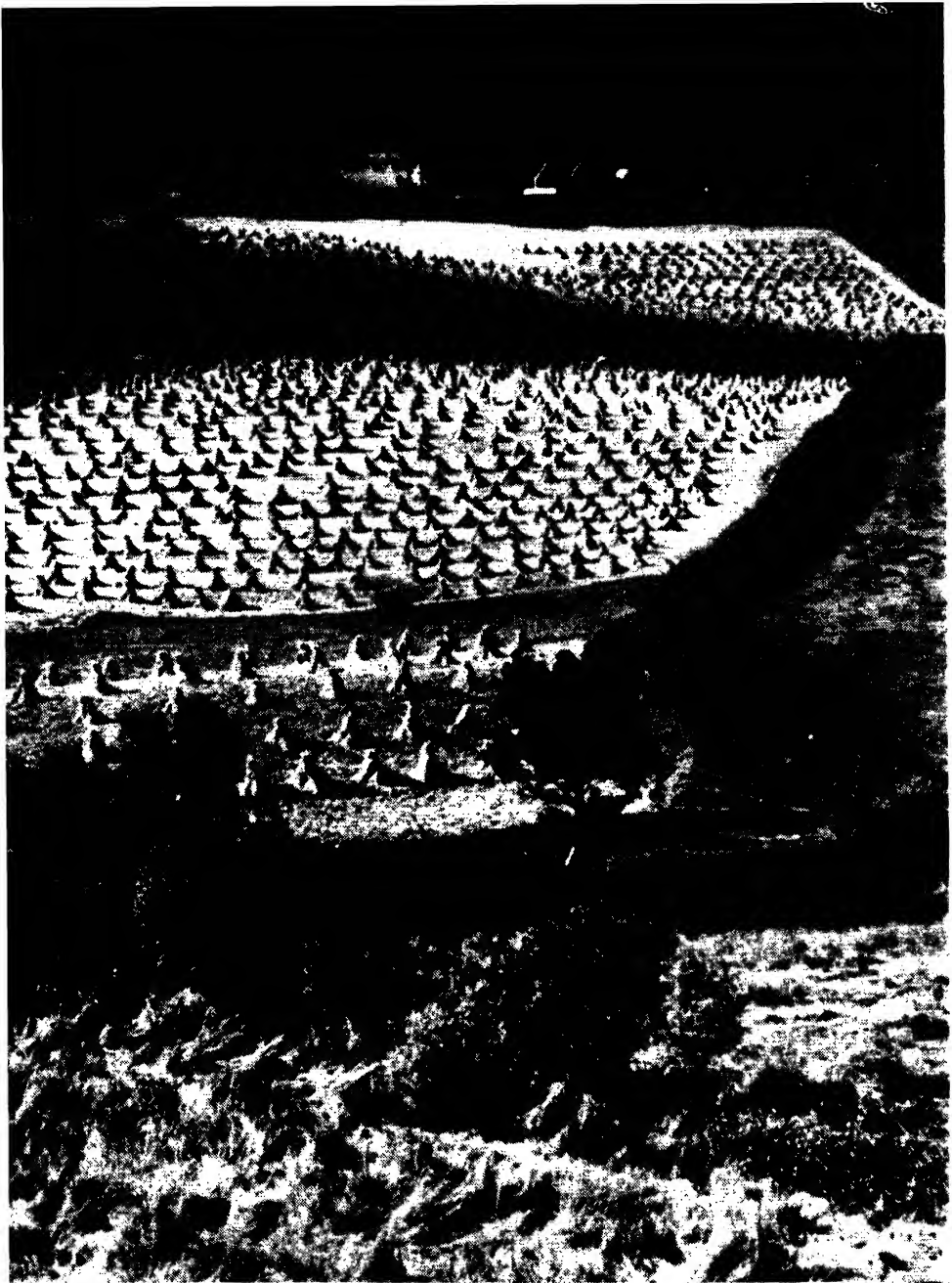


MILKING TIME





THE HARVEST CHARIOT



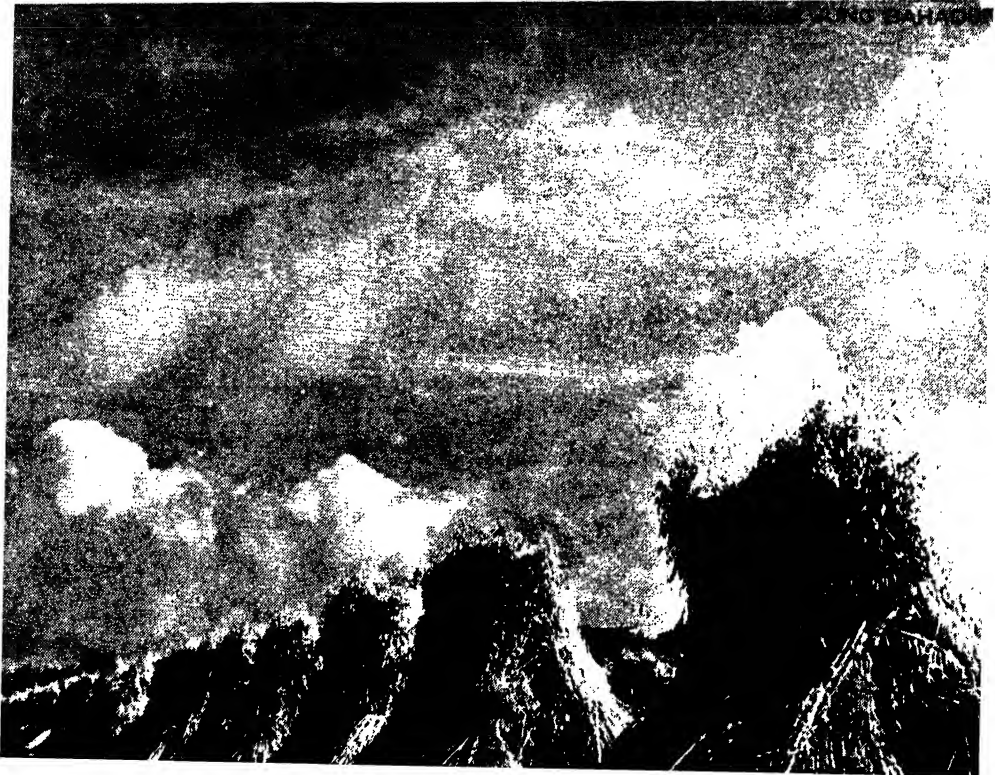
OAT FIELDS IN WALES. The ripe oats are now cut and stacked in this sunny valley. The bleached whiteness of the fields is a striking contrast to the rich green hedgerows, which have now attained the full height of their flowering. Oats are raised all over Britain, but especially in the moister climate of northern and western districts.

n to colour on the hawthorns: the rose petals are scattered. The yes are primitive gardens in which fruits are represented by crab-apple, ace, wild cherry and sloe. It is ous, when one considers, how our and cultivated landscape is criss-ssed with ribbons of that primeval land which is a hedge; a system of ire's in which man has originally no e, designed to feed birds and insects eturn for their aid in propagating its. When one considers what man evolved from the crab-apple, the l plum and pear, and how, from a ig about the size of a walnut he has duced the potato, then the gardener h his grafting knife becomes a figure re potent than all the commanders of

armies in the history of the world.

When the hay and corn are cut and carried, a hush seems to fall upon the land, broken only by the hum of man's tractor cultivation which has become so much a part of summer that we accept it as we do the humming of bees. It is just that the vigour has gone out of the scene. The fields look twice as large, now that they are cut down to their original level, and very empty: the country begins to open up again. The young of wild animals and birds are out and about in the stubble; it is as though man timed his harvesting operations to give them a good start in life. Even in these days of the mechanical reaper-and-binder, there is plenty of corn left for those welcome guests of the fields, the

THE SWEET O' THE YEAR. *At last the stooks of gathered oats are standing in the d. The day's work is over, and as the September sun sinks to rest deep shadows from the newly gathered harvest steal across the stubble.*





COLLECTING THE FRUIT HARVEST. *It is a full time job on the farm when the fruit is ripe. From dawn to dusk all available hands are busily employed in picking, sorting and carrying the fruit just as quickly as possible before the wasps and other insects have started on their destructive feasts.*

tridges, as well as for the less welcome min.

There are final flowerings and late vests and a second crop of white ver for the bees. Fine, still weather coinciding with the flowering of the ds, begets such a stir about the rances of the hives as puts one in id of the swarming days of May. A ond flowering of red clover is also ilable to them, though the first wering was not: the reason being t by some mistake in nature's organiza-n, the honey in the red clover lies too p within the flower for the bee's igue to reach. But the second crop oduces shorter, finer flowers, and in : majority of cases they are so formed it the bees can just reach the honey.

Autumn Months

In September and October the weather more spring-like than autumnal. The ise of decline and fulfilment was ongest just after harvest, when mists d heavy dews were over the stubbles. ow, after showers, the characteristics a false spring are evident; for sign of there is the crocus, a leafless one this ne, which is called locally "star-naked". ne robin sings again, and so does the ren; grass grows, though farmers say at it is a doubtful blessing, because ough cows feed on it all day there is , nourishment in it, and the milk

declines. Corn sown now in the warm earth germinates in a day or two, and soon covers the fields with a vernal brightness. The last broods of young swallows are out perching on wires and roof-ridges, trying their wings. Their parents, maybe, have already departed. As one observes them, year after year, the wonder increases that they, who have only lately left the nest, have an instinct implanted in them to fly to Africa, and some sort of inward, invisible compass to guide them on their hazardous journey

Apple Picking

The apples are gathered, but not quite all. As in the cornfield, so in the apple tree, there are gleanings left, and good fat ones for the birds. There are always some apples out of reach, and those the best, they hang there till the leaves are off the trees, and others then are evident which escaped notice. They may hang till Christmas time, and on frosty mornings starlings will be chattering and squabbling and jostling and gobbling overhead, in an eagerness all-too-human to secure the best places at the feast. The wagtail one morning may be seen dapper and a trifle fussy, like a little Mr. Pickwick, standing on the pool. The first coating of ice is thinner than glass yet it is just sufficient to bear his tiny weight. Unlike Mr. Pickwick at Dingley Dell, he does not break it.





THE PRIMROSE PATH. *A familiar sight in early spring is the sunny glitter of primroses on railway banks, under hedges, and in woods and copses. Clusters of flower-buds on long slender foot-stalks spring from a short fleshy rootstock.*



WILD FLOWERS THROUGH THE SEASONS

ICE-COVERED ponds and hedgerows thick with rime make a picture especially typical of the year's opening month, for although a mild January is not unknown in Britain, the cold is apt to intensify as the days grow longer. The light frosts of December give place to severer ones, alternating with falls of snow that invigorate the slumbering fields, cleansing and preparing the earth for the period of growth that lies ahead.

January is, in fact, a month of preparation, but even at this season there are a few wild flowers to be found, particularly in sheltered places. In a garden or a field we may come across a daisy, or a hardy groundsel plant, its fragile, erect stem sheathed with slightly sticky leaves, and topped with a few yellow flower-heads. Among woodland plants, honeysuckle is the first to put forth new leaves, and the energetic new growth, so full of promise, makes a cheering sight, even though we must wait till June for the fragrant, delicate flowers.

Seeding foxgloves, easily overlooked, can be found by the careful seeker, and humble mosses hold their own nestling in suitably sheltered places.

February, too, is more a month of promise than accomplishment. Yet on the heath the eye may be delighted by the golden glory of the gorse, whin or furze. Its greater glory is yet to be, but there is sufficient of it to whet the appetite for more and to assure us that summer is on its way. This plant is one that characterizes the English scene. It has "butterfly" flowers which indicate that it belongs to the Pea and Bean family, and these will continue to appear throughout the summer and, in some cases, in autumn. The leaves of a seedling are usually lance-shaped with well-developed blades, but as the plant grows, its leaves are reduced to very prickly spines up to $\frac{1}{2}$ inch long. Incidentally, these spines protect the species from damage by browsing animals, but such reduction of the leaf-surface is really designed to save excessive evaporation of moisture from the tissues of the plant. Gorse grows in dry places and needs to conserve its water supply. On a warm summer day one may hear crackling in the bush; this is due to curling seed-pods ejecting seeds which are shot some distance away so that new plants emerging may not crowd the parent bush.



In woods, thickets and hedgerows we see the pendant "lamb's tails" of the hazel. These are the loose male catkins from which showers of pollen grains are produced, to be wind-carried to the insignificant female catkins which are almost like leaf-buds, yet betray themselves by their rayed crimson stigmas—a small spot of welcome colour. The tiny inner bracts, after the female flowers have been fertilized, enlarge rapidly,

becoming leafy, enfolding the ripening nuts which we gather in the autumn. The catkins do their work before leaves appear, thus avoiding leafy obstruction to the free circulation of pollen.

Shepherd's purse is an early flowering weed seen in cultivated ground and waste places. Its frail white cruciform flowers and curious flat inversely heart-shaped seed-pouches abound almost through the year. The seed pouch suggests in



FROST AT BERRYLANDS. *The beauty of flowers and shrubs under a thick frost in early spring is a sight difficult to forget.*

As March approaches, the white 5-petalled flowers of the barren strawberry begin to appear on the hedge banks. It is not to be confused with the wild strawberry which makes its appearance later. The white flowers are $\frac{3}{8}$ inch or more across, the petals being notched. The leaves are made up of three egg-shaped leaflets which have serrated margins and are hairy on both sides. This is a creeping plant with stems up to about six inches long. It does not produce runners like the wild strawberry, nor does it have red fleshy fruits. Its flowering season ends in May.

March

With the advent and progress of this month, the plant world declares its great awakening and quite a number of wild flowers are to be seen in bloom. The common daisy, literally day's eye, which may show a head or two even in the darkest months, now gets properly into its stride. Its "modest, crimson-tippit flowers" may bespangle many a meadow and bring dismay to the lover of a clean grass-lawn. It is known as a compound or composite species, consisting as it does of a large number of small florets crowded into a head terminating the flower-stalk. In the centre of the head are small yellow tubular "disc" florets with stamens and pistils, each being a perfect flower, and around are strap-shaped white "ray" florets with pistils only. These white rays are tipped with crimson on their undersides, as is seen when they close to protect the head by night and in dull, wet weather. This crimson tipping is said to act as a kind of photo-chemical screen which extracts heat rays from light and so helps to keep the flowers warm on cooler days

shape the "purse" of an old-time shepherd. The root is long, tapering. The root-leaves, deeply lobed, are spread rosette-like on the ground. The erect stem, 6-12 inches high, has a few lance-shaped or oblong leaves cared at the base and clasping the stem which is terminated by a flat cluster of tiny white flowers with 4 petals arranged crosswise. The cluster lengthens into the heart-shaped pouch as the fruit is formed.

It is in March that coltsfoot comes vigorously into flower. It, too, is a composite with heads of attractive yellow florets borne on stalks about 6 inches high. As the fruits mature, the stem lengthens. The fruits containing seeds are crowned with a hairy pappus (a seedhead, similar to the familiar dandelion "clock") which helps them to be dispersed widely by wind. A noticeable feature of this plant is that flowers appear before leaves which, when they emerge, are large and covered on their undersides with cottony down, used as tinder in the days before matches were made. This species has creeping underground stems, any part of which can develop into a plant. It occurs in greatest abundance in cold clay soils in fields and waste places.

The dandelion, familiar to all and so common as to be despised, is really an attractive species, bearing a composite head of many strap-shaped yellow florets at the top of leafless, hollow, juicy stalks. The flowers are at their best in March and April, but the dandelion continues to bloom into August. The "clock", as its fruiting head is called by children, is a mass of fruits each of which is surmounted with a feathery pappus on a long thin stalk. These fruits containing seed are dispersed by wind. The ridged fruits bore augur-like into suitable soil and are held there by barb-like hooks on their upper parts. The young dandelion leaves are a wholesome and very palatable addition to a green salad.

Flowering Hedges

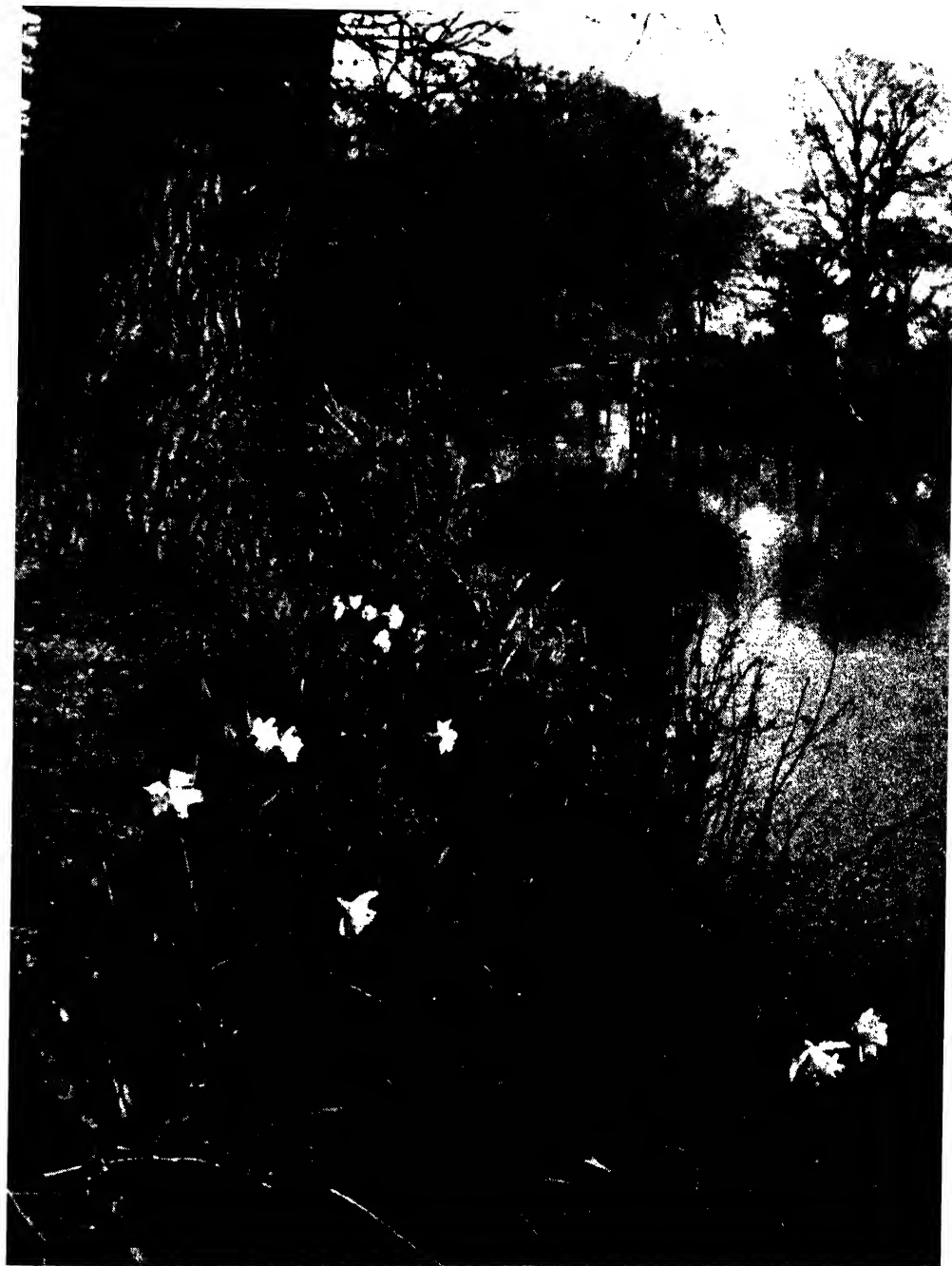
The blackthorn or sloe, before its leaves expand, displays masses of its starry white 5-petalled flowers in hedges and thickets. We have to wait until autumn to gather its damson-like black fruits with a bluish bloom. The bark of this shrub is very dark and the name blackthorn is given to differentiate it

from the whitethorn or hawthorn. Both plants belong to the rose family. Butcher's broom, a shrub of the lily family which does not suggest a lily to the untrained observer, begins to flower this month. This plant has a curious habit. The tiny greenish-white flowers grow in the centres of what appear to be leaves but are really short leaf-like branches growing in the axils of the true leaves which are reduced to minute scales. Later, in the same position, we see a brilliant round scarlet berry. The shrub is dark-green, of rigid growth, much-branched, up to 3 feet high. It is found in woods and bushy places mainly in the south of England. It is also known as box-holly.

The Lesser Celandine

Taking advantage of a season when it is not likely to be smothered by plants of tall growth and when the trees have not yet provided a shady canopy, the lesser celandine puts forth its starry flowers with glossy yellow petals. This is the flower which delighted Wordsworth and became the subject of more than one of his poems. It is of the buttercup family and abounds on banks, in meadows and waste places. The rootstock develops tubers which are renewed every year. The thick, smooth, shining heart-shaped leaves proceed mostly from the root. March, also, brings the opening of the buds of marsh marigold or king-cup, and we shall see a succession of these glorious large golden-yellow flowers well into June. The flowers may be 3 inches across and are like an outside buttercup, to whose family they belong. The plant can flourish only in damp places.

Towards the end of the month and continuing until May, in woods whose trees are not yet so leafy as to intercept much light, the dainty wood anemone may bespangle the ground. This, surely, is among the loveliest of spring flowers.



EARLY SPRING BLOOMS BY THE RIVER BANK. *The daffodil is one of the first flowers of the year to decorate the riverside. The blue-green foliage makes a particularly attractive background to the yellow flowers, which in their turn seem to catch and reflect every fleeting ray of sunshine. The daffodil flowers in March and April.*



DOG VIOLETS. *The frail purple of this delightful spring flower is emphasized by its yellow spurs and the rich dark green of the heart-shaped leaves. The flowers usually grow singly but occasionally are to be found in pairs or even threes.*

It has no petals, but the 6 sepals are petal-like; they are white or pink-tinged on the outside. The flowers droop. This species, like celandine and king-cup, is of the Ranunculus tribe. Of the same family are green hellebore and stinking hellebore, which put forth their flowers in March. Both plants seem to be wild only in woods and thickets on chalky soils in the south of England. The stout stem of green hellebore is up to 18 inches high. The few flowers may be as much as 2 inches across: they have large spreading sepals, which are green, and small tubular green petals. Stinking hellebore has smaller flowers, which are pale-green with cup-shaped purple-tipped sepals.

This month sweet violets are at their best, and in the deep, moist woods they

love to inhabit, they flower freely. The long-stalked leaves of the violet, rising from the root, are heart-shaped with rounded apices, scalloped margins, and a covering of downy hairs. This species of violet is recognized by its fragrance, for which it is cultivated: as a wildling it is often found in woods. The dog violet, which is found on hedgebanks, heaths, etc., is much more abundant. It has flowers like the sweet species, though of a rather paler blue. The pointed leaves may be broadly heart-shaped, broadly lance-shaped, or nearly round. "Dog" was formerly used as a word of contempt and in this case the prefix seems to be a reproach for the lack of that lovely fresh fragrance which belongs exclusively to the sweet violet.



WOOD ANEMONE OR WIND FLOWER. *In the spring every wood and copse is carpeted with this dainty fragile plant. If sheltered from the wind the flowers open out like stars, but when exposed to a strong sun they drop their heads. This drooping of the flower is a characteristic by which the anemone is easily recognized.*



COWSLIP. *Blooms in April and May. The funnel-shaped flowers are a rich yellow colour and have five petals.*

Ground ivy, not at all ivy-like, is seen in bloom under hedges, on the margins of woods and in waste places towards the end of this month, but it is at its richest in April and May. It is a member of the labiate family which includes the mints, dead-nettles, and sages, and always has 2-lipped flowers. This species has creeping stems which root at intervals, producing new plants. Flowering stems ascend from 6-18 inches and bear at intervals circles (whorls) of about six rich-blue flowers in the axils of opposed leaves. The plant, which has a strong aromatic odour, was formerly used by brewers in place of hops and was named alchoof. It is employed as a medicine by herbalists.

In our wild flower world, the primrose is surely Queen of April—

Primrose, first-born child of Ver,
Merry spring-time's harbinger.

There is little need to describe a flower so well-known and beloved by all, although much might be said that is scientifically interesting. We may discover an odd flower or so in a sheltered place even in mid-winter, but April is primarily the primrose month. Then it blooms in millions, bespangling the floor of open woods, brightening railway banks, glorifying meadows. The flowers may be freely gathered without damage to the plant so long as the perennial rootstock is undisturbed. The cowslip, so close a relation of the primrose as to be regarded by some as only a variety of it, seems to delight in more open situations in meadows and pastures. The sweet-scented flowers are brighter yellow and there is an orange spot at the base of each corolla lobe: they are smaller than those of the primrose and occur in a cluster on stalklets rising from a common centre, at the top of the main flower-stalk, which may be from 4-12 inches high. The calyx is inflated, it has a rounded look, as though filled with compressed air.

The wild hyacinth, or bluebell, a little later than the primrose, begins to put forth its loose drooping clusters of purple-blue (occasionally white) flowers this month, but gets properly into its stride in May, continuing well into June. It likes woods and shady places and often grows so thickly that the flowers produce the effect of a blue haze among the tree-boles, light in the foreground, deepening to cobalt in the distance. Massed thus in their countless thousands, these sweet-smelling members of the lily family complete a woodland scene hard to excel in loveliness—a scene typical of the English countryside at this time of year.

Cuckoo-pint, otherwise called wild arum, lords-and-ladies, or wake robin, becomes conspicuous in the English or Irish hedgerow or wood this month and by its singular looks always captures the interest of the observer. Indeed, it is a



BLUEBELLS IN THE WOOD

CUCKOO-PINT. *This spear-shaped greenish-white plant unrolls to disclose a plum-coloured or yellowish central spike.*

curious plant. The large glossy arrow-shaped leaves are often purple-spotted, but the flower is the chief point of interest. A translucent yellowish-green sheath, known as a spathe, 6 inches long or more, partially encloses a flowering column topped by a plum-coloured or yellowish club. This column is called the spadix, and its base is encircled by a cluster of yellowish female flowers. Above these is an encircling cluster of purple male flowers, and higher still we find a cluster of bristly sterile female flowers with the bristles pointed downwards. Flies, attracted by the odour of the plant, become imprisoned and cannot escape until the upper sterile flowers sag and the contracted "waist" of the spathe expands. By that time the flies have pollinated the lower cluster of female flowers and later in the year we see the result in an attractive cluster of bright scarlet berries. This species is not common in Scotland.

Garlic Scented Thickets

Garlic, or ramsons, opens its flowers in April, continuing to unfold them until July. It favours thickets and moist shady hedgerows, just as if it were designed to give light and cheer where sunshine hardly penetrates. But though its head of star-like white flowers is delightful, its strong odour of garlic is just the reverse. The flowering stem is triangular, up to 12 inches high, and the flowers are arranged in a flat cluster, with their stalklets emerging from a common centre. The leaves are broadly lance-shaped and all come from the root. This species belongs to the lily family. There is another plant with not so strong an odour of garlic which comes into flower this month—garlic mustard or jack-by-the-hedge. This is not at all lily-





like, for it is a crucifer, i.e. a member of that large family of plants, including cabbages and cresses, which invariably have 4 petals arranged crosswise, in the manner of a Maltese cross. We see jack-by-the-hedge standing upright, sentinel-like, in the hedgerow, perhaps as much as 3 feet high. He wears the fresh shining green of spring, his stalked leaves being broad heart-shaped, with coarsely-toothed edges and distinct veins, 1-3 inches long. The pure white flowers with 4 sepals, 4 petals and 6 stamens, about $\frac{1}{4}$ inch in diameter, occur in clusters. Another name is sauce-alone, doubtless due to its mild garlic flavour being formerly used for cooking purposes.

In April the welcome rose-pink flowers of the red campion begin to adorn the hedge-bank and we continue to enjoy them through the summer. This plant belongs to the pink family, having

MARSH MARIGOLD. *A conspicuous plant known in many districts as the king-cup. To be found in river meadows in spring.*



stalkless egg-shaped leaves opposing each other at intervals on the stem which may be up to 2 feet high. Male and female flowers occur on separate plants, the male having 10 stamens and the female 5 styles. The 5 sepals are united and hairy.

In the same botanical family, but quite different in appearance, is greater stitchwort, also to be seen on the hedgebank. The starry slender-stalked flowers, about $\frac{3}{4}$ inch across, each with 5 white deeply-cleft petals, are real gems; they occur in loose clusters. The plant is sometimes called satin-flower on account of the satiny lustre of the petals. The slender 4-angled stems range from 1-2 feet high and are very brittle. The leaves are narrow, tapering to a point. This is a very common species. Not nearly so common, yet of the same family, are seen in dry fields and on banks the delightful white flowers of the field mouse-car chickweed. These are up to 1 inch across and appear on longish stalks in loose clusters. The margins of the 5 sepals are membranous. The 5 petals are notched and twice as long as the sepals. The stem is branched from its base, 6-8 inches high, covered with hairs, and the leaves are oblong.

The white deadnettle, so often to be seen in the hedgebank, may display flowers this month and cannot fail to be noticed. It will make a great show in May and continue to appear until September. Its creamy-white 2-lipped flowers, about 1 inch long, with black, hairy anthers, grow in dense circles round the stem in the axils of the leaves which are nettle-like but do not sting. The red deadnettle favours cultivated ground and waste places; its flowers, of a dull-red colour, are clustered in circles in the axils of the leaves at the top of the stem, which is branched from the base. Both these plants, now so common in our country, are really intruders, having come from

overseas and established themselves in the wake of cultivation. The yellow deadnettle, yellow archangel, or yellow snout, occurs in woods and hedges fairly frequently in the Midlands and South of England, but it is a rarity in Scotland. It displays the usual deadnettle characteristics, but the flowers are yellow.

Towards the end of the month, the elegant little wood sorrel begins to vie with the wood anemone on the woodland floor. It will delight us until August, long after the anemones have said goodbye to the season. Its yellowish-green leaves, divided into 3 notched leaflets, on longish stalks, catch attention as readily as the large elegant white or pinkish flowers with mauve veins, and the leaves have the rather unusual habit of folding in the manner of butterflies' wings, or "going to sleep" at night and in cold dull weather. This plant is probably the true shamrock of St. Patrick. It belongs to the geranium family, and so, quite unlike it in outward appearance, does herb-robert, which begins to display its pairs of bright-pink 5-petalled flowers about the end of this month. The erect or spreading stem is often red and the leaves are so deeply divided as to appear fern-like. The whole plant later in the year assumes a red autumn tint. It occurs on old walls, in hedgerows and waste places. When bruised it has a disagreeable smell.

The cuckoo-flower, lady's smock or milkmaids, abounds in moist meadows this month and through May. Its flowers, which are white or lilac, up to $\frac{3}{4}$ inch across, are clustered on the top of a stem about a foot or so high. The sepals are purple-tinged and the four petals, arranged crosswise in the fashion of all crucifers, are veined with deep lilac. The leaves from the root form a rosette and are divided into a few pairs of opposing roundish leaflets. The stem leaves have narrow leaflets.



BLUEBELL OR WILD HYACINTH. *The blue carpets of spring in woodland glades resemble at a distance a haze of smoke. The flower consists of six curling leaves.*

In the hedgerows the wild beaked parsley or keck, beloved by rabbits, grows sturdily. Its stem is erect, 2-4 feet high, furrowed, hollow, hairy. The leaves are fern-like, with divided and subdivided leaflets. The clusters of small white flowers are up to 4 inches across and form umbels, that is to say, inflorescences borne on many stalklets all radiating from one point.

In woods and pastures hospitable to the wild hyacinth, we may find an early-flowering orchis, known as the early purple. The purplish flowers are borne in an erect cluster terminating a stem which may be from 8-18 inches high. The flowers have twisted ovaries and long spurs turning upwards. The leaves are up to 5 inches long, lance-shaped, usually marked with purple spots. But don't think of gathering the



BUTTERCUPS. *Perhaps the best-known wild flower in Britain, the buttercup is found in almost every meadow and field.*

flowers for table decoration; they have a most offensive smell.

Out on the heath, the bilberry, blackberry or whortleberry is displaying its little drooping reddish-green bell-like flowers from which later the succulent berries may be gathered to make a tart or a pudding. These berries are black, covered with a bluish bloom.

May Flowers

As is to be expected, May brings us many more flowers, so many that it might prove tedious to have a description of those that are less conspicuous. Let us think mainly of those which catch and delight the eye. There is, indeed, may itself, the hawthorn or whitethorn which towards the end of the month begins to patch the hedges with its fragrant flowers. By June it is in full glory,

spreading its cloudy white and pink in dense masses over the countryside, lining fields and lanes with a lavish beauty not to be matched all the rest of the year.

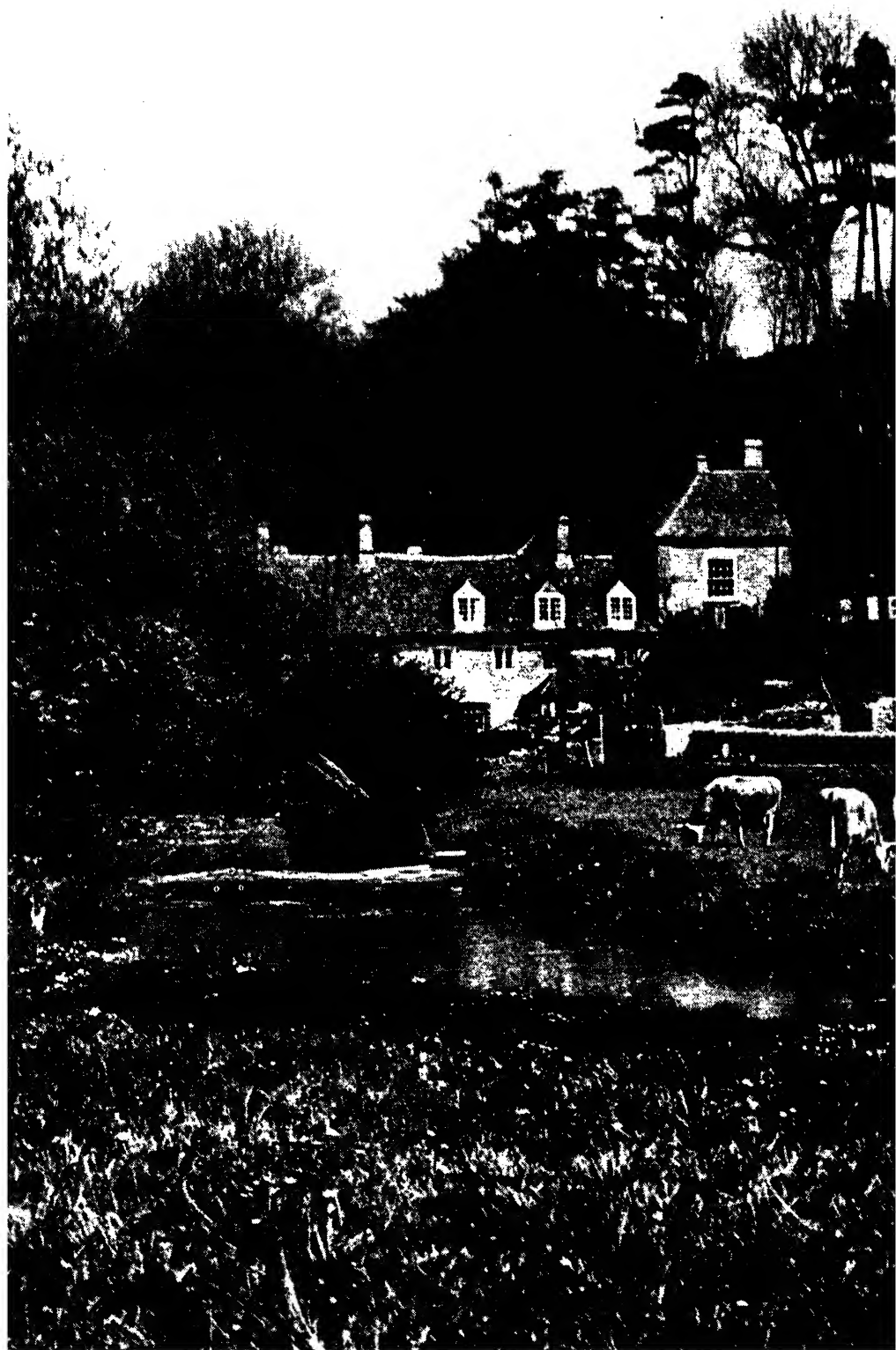
May is buttercup month, when the bulbous buttercup flourishes in pastures. Its yellow 5-petalled flowers are about an inch across and the 5 hairy sepals are bent back. This species can always be known by the thickening at the root which suggests a bulb. The creeping buttercup is rampant in meadows and pastures and a persistent weed of the garden. It has a creeping stem which roots where it touches and so forms new plants. The bright yellow flower is about $\frac{3}{4}$ inch across. Perhaps a week or so later, the more imposing meadow buttercup appears. It may be 2 or 3 feet high, bearing yellow flowers one inch across at the ends of stem and branches. The stem is hairy, round, not furrowed.

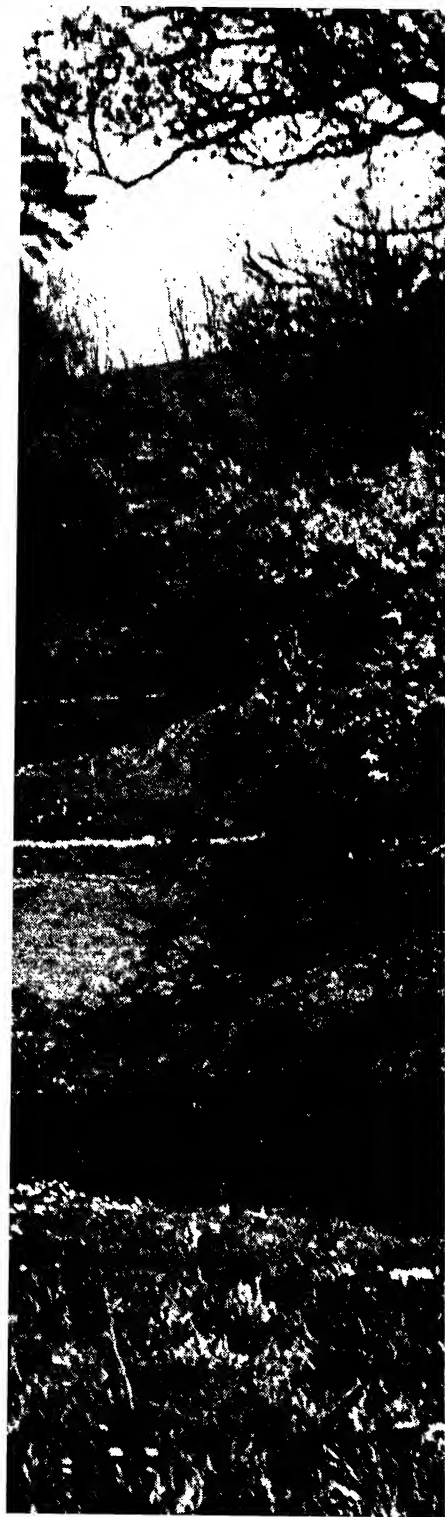
In fields and waste places the white or evening campion blooms. The few white flowers, up to $1\frac{1}{4}$ inches across, grow in loose clusters at the top of a stem 1-3 feet high. The tubular calyx is swollen and marked with 10 green ribs. The flower usually opens only at night when its sweet fragrance attracts moths. Of the same genus, the easily recognized ragged robin attracts attention in moist meadows and marshy places. The 5 rose-pink petals are deeply cleft as if torn to rags. The flowers are in loose clusters.

On dry banks and in sandy places broom begins to make a fine show of its yellow pea-like flowers with the styles of the pistils spirally coiled. This shrub is of the pea family and grows up to 6 feet high, greatly out-distancing its humble but abounding relative, white or dutch clover, common in pastures and meadows. The short-stalked white flowers of this species form dense heads each at the end of a stalk. The leaves are divided into 3 leaflets. Red clover is of



JACK-BY-THE-HEDGE. *A plentiful hedgerow weed flowering profusely in May, this plant has a strong smell similar to that of garlic. The caterpillar of the orange-tip butterfly is often found feeding on the pods which they resemble in colour.*





FIELDS ARE FLOWERING. *April sunshine brings out a haze of buttercups in all their ever-new spring brilliance.*

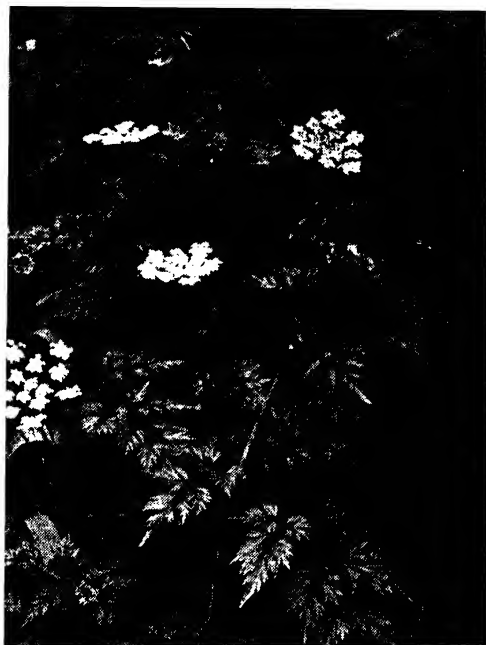
more vigorous growth and is cultivated for fodder. In addition it produces abundant nectar which bees extract—the clover honey resulting from their labours is an especial delicacy. Hop clover, or hop trefoil, has very small yellow flowers, about 20-40 in an oval head, which fade into a yellowish-brown and suggest hops. It is very common in fields and pastures. Early flowers appear this month, but others will follow in greater profusion in June and on to August.

In wet places, the yellow flag or iris flaunts its large yellow flowers with stigmas like petals and leaves like sword blades 2 feet or more long.

Hedgerow Climbers

Walking by a hedgerow which has been allowed to go its own way, our attention may be arrested by a climbing plant with shining green palmate leaves, straggling over the hedge and holding on by means of tendrils. This is white bryony which begins to flower this month and will continue to do so until September. In its quest for light and air it may climb to a considerable height. The flowers which are whitish and green-veined, about $\frac{1}{2}$ inch across, are in small clusters at the end of stalks produced from the axils of the leaves. Male flowers are on one plant, female on another: the latter produce juicy scarlet berries which should not be eaten. This plant is common in most parts of England, but not in Scotland.

In the same hedgerow black bryony may also be seen. It climbs by twining round the vegetation of the hedge, not by means of tendrils, and attains considerable height. The leaves are heart-shaped and glossy; before fading they



FOOL'S PARSLEY. *A common weed found in fields; the smell is unpleasant.*

MEADOW-SWEET. *The minute yellowish flowers are numerous and sweetly-scented.*



assume an attractive yellow tint. Small greenish flowers occur in loose clusters, the male on one plant in erect clusters; the female on another plant in shorter curving clusters. The fruit is an oval scarlet berry. This species is not found in Scotland or Ireland. It is of a different family from that of the white bryony, and its flowering season is usually over by the end of June.

If the hedgebank is sufficiently damp it may provide a home for comfrey, a rather large coarse plant, perhaps 2 or 3 feet high, with rough lance-shaped leaves up to 10 inches long. The tubular purple, white or pink flowers, each about $\frac{1}{2}$ inch across and $\frac{3}{8}$ inch long, grow in one-sided forked clusters which droop and in the bud stage are coiled. Comfrey is found in many moist places; its leaves if used in a fomentation reduce inflammatory swellings.

The Speedwell Family

Germander speedwell or bird's-eye is the best-known of 20 or so veronicas or speedwells in our flora. The plant is a small one, its stems usually only a few inches long, hardly ever more than 12 inches. The leaves are egg-shaped, with margins deeply toothed. Careful examination reveals that two lines of hairs run down the stem, changing sides at each pair of opposing leaves. The deep-blue flowers are very attractive; they are about $\frac{1}{2}$ inch across, occurring in loose clusters at the end of rather long stalks.

In woods and moist places common or creeping bugle comes into flower. This is a plant bearing 2-lipped blue flowers in circled clusters round a square stem up to 12 inches high, the complete inflorescence looking like a spike with blue-tinged leafy bracts among the flowers. On the stem are a few pairs of shiny oval leaves. The few root-leaves have scalloped margins, and there are

creeping runners. If the woodland floor is moist enough it may display yellow pimpernel, or wood loosestrife, a member of the primrose family. The delicate starry yellow flowers, about $\frac{1}{2}$ inch diameter, on long stalks, spring from the axils of the leaves. The stem, up to 12 inches long, creeps over the ground. The leaves are glossy, egg-shaped, pointed, opposite one to another. Wood sanicle, as its name implies, is a woodland plant. The stem is from 9-24 inches high, without branches, almost without leaves. The leaves rise mainly from the root and have long stalks and blades deeply cut into 4 or 5 segments which are toothed. The tiny flowers are pinkish-white and occur in small umbels about $\frac{1}{2}$ inch across.

In a similar spot, as well as in pastures, we find earth-nut or pig-nut, with a slender, slightly branched stem up to 1 foot high. The fern-like leaves are deeply cut, and the small white flowers are in compound drooping umbels about $1\frac{1}{2}$ inches across. Small, brown-skinned tubers produced by the roots are much enjoyed by pigs. Woods are also the home of sweet woodruff, which has stems up to 10 inches long bearing circles of 7-9 lance-shaped leaves at intervals and stalked clusters of small fragrant snow-white flowers with 4 petals crosswise. When dry, the plant has the scent of new-mown hay.

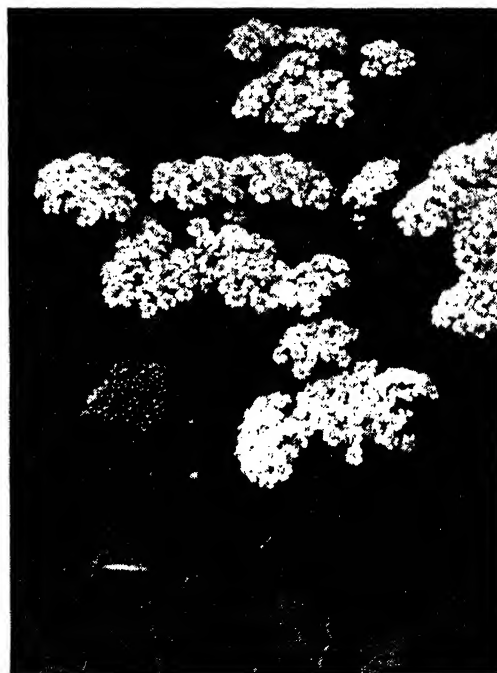
Twayblade is found in woods and moist pastures. It is an orchis growing to a height of 1-2 feet, distinguished by 2 egg-shaped, ribbed, opposed leaves about 3 inches long, placed about half-way up the round stem. The small green flowers grow in a long, loose spike.

Poppies boldly advertise their foreign origin and exotic charms in cultivated fields as well as in hedgerows. They are weeds of cultivation which have followed agriculture from the east in its westward trek. In the south, the common



EARTH-NUT. *The root is edible and when cooked tastes something like a chestnut.*

YARROW. *The erect flowering-stem attains a height of well over a foot.*



red poppy flourishes its scarlet banner over cornfield and hillside in glowing patches. Its 4 bright scarlet petals are frequently black at their base, and a further distinguishing feature is the almost spherical smooth seed-capsule, which scatters the numerous small seeds like a sugar-caster. In the north, particularly in Scotland, the long smooth-headed poppy generally displaces this species. It has rather smaller flowers and its smooth seed-capsule is oblong. Both kinds continue in flower until July; they are, perhaps, most evident in June, making a fine splash of colour amid growing corn.

The wild pansy or heartsease can be recognized by any one who knows a pansy; but as a wildling its flowers are small in comparison with our garden

HEARTEASE OR WILD PANSY. *This tiny flower is found on hilly pastures and waste places, from May till September.*



varieties which are said to have been developed from variations of this weed of cultivated fields. It also appears on heaths and there in a much more pronounced pansy-like form, but the species as a whole is exceedingly variable.

Scarlet Pimpernel

The dainty little scarlet pimpernel belonging to the primrose order, also appears in cultivated fields, and in gardens where it often proves a nuisance. Yet all is forgiven on account of its bright scarlet flowers. These are about $\frac{1}{2}$ inch across, and have 5 petals joined at their base. They are very sensitive to weather conditions, always closing when rain is in the air—from this peculiarity the flower has earned the alternative name of "Poor-man's-weather-glass".

On old walls among the crevices of loosened cement the ivy-leaved toadflax secures a hold and shows its small snap-dragon-like flowers. These are lilac and yellow. The corolla is spurred; its upper lip is formed by 2 petals fused together and the lower lip is of 3 petals. The branched stems are from a few inches to upwards of 2 feet long and have a trailing habit. The shiny, fleshy leaves are kidney-shaped, about 1 inch across, and 5-lobed.

In hilly districts in the north, particularly near old houses, sweet cicely makes an attractive show. It is one of those plants which bear small flowers in compound umbels as already explained (p. 45). In this instance the flowers are creamy-white with an aromatic smell. The fruits, which are strongly ribbed, brown when ripe, are held erect and have a flavour resembling that of aniseed. The leaves are much broken up and fern-like, and often there is a sort of grey dusty mark at the base of the blade. The plant is usually found in extensive masses. Formerly it was cultivated in herb gardens and used in cooking.



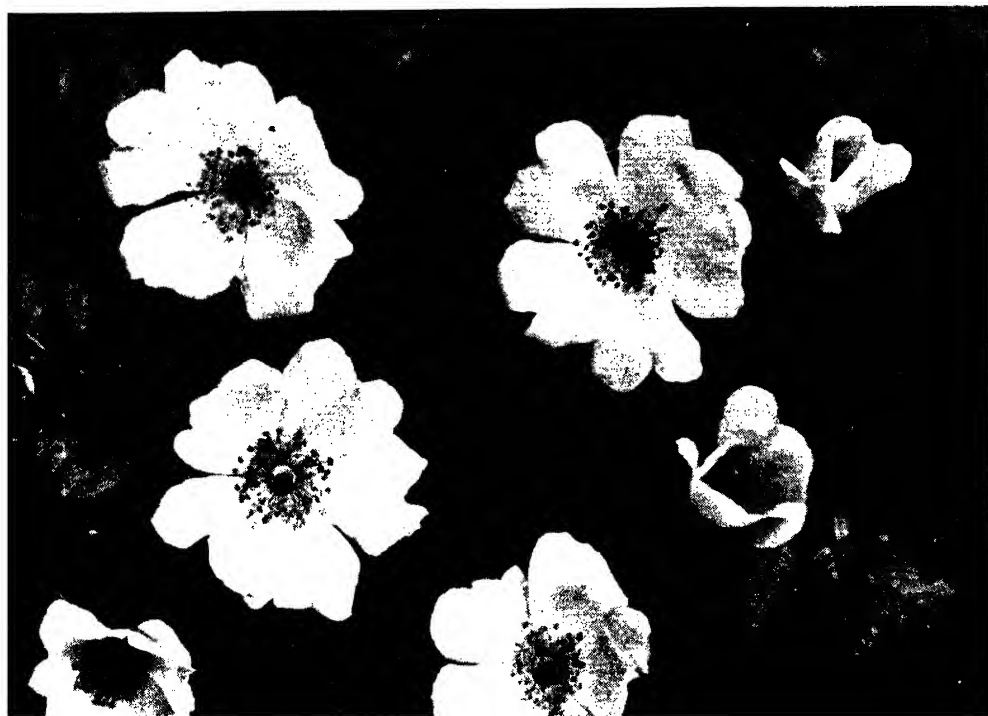
The peculiar flowers of yellow rattle are seen in fields and pastures. Folk of long ago seemed to delight in making analogies and they likened these flowers to a cock's comb and named it accordingly. The single wiry 4-sided stems are from 4-12 inches high and bear a spike of flowers with a gaping 2-lipped yellow corolla and a blown-out flattened calyx. This calyx is light green in colour and has a four-toothed mouth.

The seed capsule is like a bladder and the loose seeds rattle in it—hence the name. This plant has the vicious habit of extracting some of its nurture from the roots of grasses. The same trait distinguishes the eyebright, a small plant of the meadows bearing leafy clusters of small purplish or white flowers delightfully variegated with yellow. It is sometimes used by herbalists as a remedy for eye troubles.

A long list of June flowers might be compiled. Summer now comes into its heritage and many kinds of plants display their charms, not designedly for the delight of human beings, but to attract insects for the necessary work of pollination. Most of the earlier flowers continue to bloom, and with the advent of the flowery month of June great is the competition for a place in the sun.

This is the month when roses reign over the English countryside. Our common dog rose appears in hedges and thickets, using its many prickles as climbing-irons, and displaying its large pink or white fragrant flowers. This species is very variable. On sandy shores, commons and heaths the burnet, or scots rose, is recognized by its low growth and stems crowded with straight prickles among which bristles are mixed. The flowers grow singly and are very

JUNE ROSES IN FULL BLOOM. *The hedgerows are in full flower in June and July. The dog rose is to be seen everywhere, its sweet-scented pink or white flowers which open in the sun display a golden centre rather like a coronet.*



fragrant. The fruits are almost spherical and of a purplish-black colour. Sweet briar is found in hedges and bushy places and is loved for the fragrance of its leaves—a fragrance reminiscent of green apples a hundred times intensified. This is the eglantine of many poets, recalling Shakespeare's lines

I know a bank, whereon the wild
thyme blows,

Where ox-lips, and the nodding violet
grows;

Quite over-canopied with lush wood-
bine,

With sweet musk-roses and with
eglantine.

The great bindweed or convolvulus gets a grip of bushes and hedges by twining, often strangling plants in its snake-like grasp. It may climb to a considerable height, and makes a great show of its large trumpet-shaped white flowers. The blooms charm the eye, but the plant is a pest in cultivated places. Its roots penetrate deep into the soil and are difficult to eradicate. An almost equal pest is the lesser bindweed or convolvulus. Its stems trail over the ground and twine about nearby plants. The handsome flowers are smaller than those of the great bindweed, not quite so distinctly trumpet-shaped, and though occasionally white, they are generally pink with deeper pink stripes.

In meadows and waste places the rather charming ox-eye daisy may abound, for it can thrive on very poor soil. The rather large daisy-like flowers up to 2 inches across, consist of tubular yellow central or disc florets and long white strap-shaped rays. In Scotland this species is commonly called horse gowan and elsewhere some people call it moon-daisy or marguerite. Among growing corn a near relative may occur; this is corn marigold or yellow ox-eye which, growing up to about 18 inches high, displays large daisy-like heads in which

both central and outer florets are golden yellow. The smooth leaves have a bluish green hue.

Stinking chamomile appears in cultivated fields or nearby waste ground, particularly in the south, but it is not common in Scotland. This, again, is a daisy-like flower with flowerheads topping the many branches so as to appear clustered. The heads are about 1 inch across and have central yellow florets and white rays. The leaves are much divided into linear segments and when crushed, give out a most objectionable smell. Scentless mayweed or corn feverfew appears in cultivated ground and waste places and will continue to bloom until October. The daisy-like solitary flowerheads terminate stem and branches. There are central yellow florets and white rays comprising a head from 1-2 inches across. The disc bearing the florets is distinctly convex in its formation.

Flowers of the Cornfield

The cornflower is one of the loveliest of cornfield plants and it frequently occurs where turnips are grown. It has been given several local names, such as blue-bottle, blue-bonnet and blue-cap. The composite flowerheads comprise a few large, very bright blue neuter outer florets and purplish-rose inner florets with stamens bearing purple anthers. Varieties of this plant are deservedly cultivated in gardens. It continues to bloom until October. Corn-cockle also has its attractions as it flaunts its pinkish-mauve petals among the growing corn. It is not a native of these islands and is not common, and on that account is the more conspicuous when it appears. It may reach a height of 2 or 3 feet. The long strap-shaped leaves grow opposed on the hairy stem which is swollen at its joints. The 5 petals of the corolla, up to 2 inches across, are exceeded by the long green teeth of the calyx.

STINKING CHAMOMILE OR MAYWEED. *Although an attractive plant to look at with its bright daisy-like flowerheads and golden centres this is a tiresome weed from the farmer's point of view for it flourishes in cultivated fields and is difficult to eradicate. When it is crushed the flowers give out an offensive and penetrating smell.*



Bladder campion or white bottle appears on the wayside and on other waste ground, particularly where the soil is chalky. Like the corn-cockle, it belongs to the pink family. The stems are erect, up to 2 or 3 feet high and they have a bluish bloom; the oblong opposed leaves are pointed. The flowers are about $\frac{3}{4}$ inch across and droop on their stems, their fragrance being noticeable at night. The white petals are deeply notched, and the calyx is blown-out like a bladder and has netted veins with a purplish tinge. Silverweed straggles over the wayside and attracts attention by its leaves, which are split to the midrib into pairs of opposing leaflets covered with silky hairs and underneath present a silvery appearance. The bright-yellow 5-petalled flowers, up to 1 inch across, occur singly on rather long stalks; they will continue to appear through July and August.

Were it not so common and so troublesome, we might be tempted to cultivate ragwort, which this month begins to display its flat masses of composite yellow flowerheads by the roadside and in pastures. This plant is from about $1\frac{1}{2}$ to 3 or 4 feet high and has deeply-lobed leaves, the upper ones clasping the stem. The disc florets are tubular and the strap-shaped rays have a spreading habit. Flowers will appear up to October.

In waste places and possibly by the roadside, common mallow begins to bloom and will continue to do so until autumn. We can hardly fail to recognize its showy lilac, crimson-veined, 5-petalled flowers about $1\frac{1}{2}$ inches across, growing in clusters from the axils of the leaves. These leaves are ivy-shaped, 2-3 inches across, with 3-7 lobes.

Creeping cinquefoil also grows on roadsides as well as in pastures. It is of the rose family, with yellow 5-petalled flowers about $\frac{3}{4}$ inch across, rather like those of silverweed; they occur singly

on long stalks springing from the axils of the leaves. The stem, up to 18 inches long, creeps over the ground and roots at its joints. The leaves are cut into 5-toothed leaflets. On some waysides the hoary plantain occurs. It likes dry places, particularly on the chalk. The leaves form a rosette close-pressed to the ground. A long stalk is terminated by a cylindrical spike of small scented flowers and one is pleased by the effect of the long stamens which make a display of their lilac anthers.

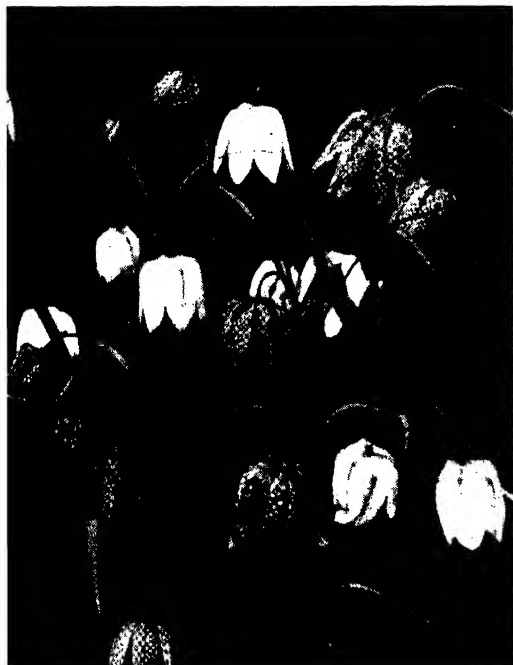
Hemlock, which is a very poisonous plant, flowers by the wayside and on banks. It may be 2 or 3 feet high and is one of the numerous family of plants which have small white flowers clustered in umbels (see p. 45). The leaves present an elegant appearance; they are cut, and re-cut, fern-like. This plant can always be known by its smooth stem which has

CORN MARIGOLD. *This flower is also known as the scentless mayweed. It is commonly to be found in cornfields.*



red spots, and the 3-5 little green bracts beneath each partial cluster and the general cluster. On a similar site, as well as in fields, especially not far from the sea, the wild carrot sends its tap-root deep into the soil. Its stems are furrowed and branched, 1 or 2 feet high. The hairy leaves are cut and again cut into narrow segments and the small white flowers are in a general umbel composed of other, smaller umbels. When the fruit is being developed, the entire cluster becomes hollow, cup-like. Generally in the centre of the cluster there is a purplish flower which in its solitude makes a curious appeal to the eye. The cow-parsnip, or hogweed, of the same family as the carrot, either by the hedge, or in a wood or meadow, with flowers clustered in umbels, impresses us by its size. It may be 6 feet high, although in poor soil it is often much less. The hollow, furrowed, hairy stem bears leaves cut

FRITILLARY OR SNAKE'S HEAD. *In the south of England this delicate bell-shaped flower is often found in wet meadows.*



into 2 or 3 broad, often lobed, leaflets, and at the base of the leaf-stalk there is a growth which sheathes the stem. The flower clusters are large and consist of sub-clusters of small flowers which may be pinky-white or greenish.

Prickly Flowers

The plant in the hedgebank with small prickly green globular burrs which cling to one's clothes, and straggling prickly stems with whorls of small leaves, is goosegrass or cleavers. In Scotland it is called stick-willy. The prickly fruits are the products of small white flowers which rise in small clusters from the axils of the leaves.

The great stinging nettle is now in full growth on the hedgebank and elsewhere. One takes more notice of the painful consequences of coming into contact with its curious flinty stinging hairs than of its small green flowers which hang in long, loose clusters. Black horehound appears on hedgebanks towards the end of the month, but is in fuller flourish in July and August. This is a rather coarse plant 2 or more feet high, with branches. The stem is 4-sided, the leaves are egg-shaped or heart-shaped, wrinkled, with scalloped margins. The flowers are purple with 2-lipped corollas, and the plant has an offensive smell. It is sometimes used medicinally by herbalists. Hedge woundwort also has an objectionable smell. By the end of this month it begins to show its spikes of dull-purple 2-lipped flowers set in circles of 6-10. The plant is up to 3 feet high and abounds by hedges and waysides.

Agrimony often grows by the wayside, as well as in meadows and copses. It is valued by herbalists for its tonic properties, and folk of former generations made infusions from it which they called agrimony tea. The small yellow 5-petalled flowers grow in a long spike on a slender stem from 1-3 feet high. The



leaves are cut to the midrib into leaflets, smaller leaflets alternating with larger.

Bittersweet or woody-nightshade, belonging to the potato family, has a stem that is woody at the base, and it generally climbs among bushes and hedges in order to get the benefit of light and air. If it cannot find a suitable support it will trail on the ground. The flowers have 5 purple reflexed petals and in the centre we see a very marked cone of yellow anthers; they are about $\frac{1}{2}$ inch across and are borne in forked drooping clusters. The fruit is a scarlet berry. The deadly nightshade, which is rather rare, has bell-shaped purple flowers with a green tinge, and its poisonous berries are purplish-black.

Lady's bedstraw, otherwise our lady's bedstraw, has small bright-yellow flowers which in their compact clusters make a fine, attractive show on the hedgebank

and elsewhere. The stems are from a few inches to 2 feet long. The almost threadlike leaves occur in distant circles of 6 or 8. The plant will continue to bloom until September. The tufted vetch may be seen climbing up the hedge by means of the tendrils at the end of its leaves which are divided into a number of pairs of narrow leaflets. The attractive pea-like flowers, which are blue with purple or mauve shading, occur in long one-sided clusters on long stalks. Later on, flattened pods will develop, each containing 6-8 seeds. Meadow vetchling, of the pea family, has stems up to 3 feet long which straggle or climb. It is common by the wayside and in meadows. The leaves are of 2 lance-shaped pointed leaflets and have a central tendril. Long stalks terminate in clusters of bright-yellow pea-like flowers.

Honeysuckle twines about the haw-

SWEET SCENTED HONEYSUCKLE. *A well-known climbing plant whose rich fragrant odour attracts the long-tongued moths at night. Honeysuckle is so formed that humble bees cannot obtain its rich honey which often half fills the corolla.*



horn or other material of the hedge, lifting itself to a considerable height. Its grip may do serious harm to saplings in copses. June is the month when it begins to bloom; its sweetly fragrant flowers will go on appearing until the end of September. Nectar is secreted at the bottom of the long corolla-tube and can be gathered only by insects with long tongues. The fruit is a round crimson berry, and grows in clusters.

Crane's-bill

Our most distinguished wild geranium, the meadow crane's-bill, flowers from June to September and will be seen in damp meadows and other moist places. Its large bluish-purple flowers, with 5 petals, are about $1\frac{1}{2}$ inches across, and a joy to behold. The fruit has a fancied likeness to the bill of a crane—hence the name. In a similar spot, we find meadow-sweet or queen-of-the-meadow, which is related to the spiræas of cultivation. The stem is up to 4 feet high, tinged with purple and furrowed. The leaves are cut into pairs of unequal leaflets and a terminal leaflet; they are generally whitish underneath. The small sweet-scented creamy-white flowers are about $\frac{1}{4}$ inch across and they occur in crowded clusters. A close relative, dropwort, is adapted to life in drier soil: it appears in pastures, most abundantly in chalky districts. The flowers are larger than those of meadow-sweet, and fewer. In bud the outsides of the petals are pink. There is no scent. The leaves are cut into many narrow leaflets and are not white underneath. The stem is up to 2 feet high. One of our common orchids, the spotted orchis, also occurs in moist meadows. The stem, about 12 inches high, is slender and it ends in a dense tapering spike of white or pale-lilac flowers spotted and variously lined with purple. The leaves generally carry large dark-purple spots of varying shapes.

About the end of the month field scabious begins to flower, but it is in July that it reaches its full beauty; it will continue to bloom until September. This is the largest of our scabious plants with beautiful lilac flowers clustered into dense heads about $1\frac{1}{2}$ inches across, the outer flowers being larger than those in the centre. The stout hairy stems, 1–3 feet high, have long spreading branches above. The plant favours dry banks and fields and is very common on chalky soils.

It is in pastures on such soil that we look for the rock-rose with its woody prostrate stems up to 10 inches long and stalked yellow 5-petalled flowers in long one-sided clusters. The small oval leaves, growing opposite to each other, are white with downy hairs beneath. Flowering will continue into September.

Dry pastures are the favoured habitation of the common centaury, a member of the gentian family, rather variable in its form. Generally it has branched erect square stems from a few inches to 18 inches high with clusters of pink or rose-coloured flowers which open only in good weather. These flowers are about $\frac{3}{4}$ inch across and very charming. In dry hill pastures the wild thyme blows. The little 2-lipped purple flowers are crowded into heads and the plant occurs in delightfully fragrant cushions.

Rest-harrow, a plant of the pea family, is found in dry pastures, on heaths and sandy seashores. It is a sort of under-shrub varying its habit according to its location. The stem is tough, about 1 or 2 feet long, and branched. It is generally prostrate, giving off rooting runners, but it may form a sort of bush. The pink pea-like flowers, about $\frac{3}{4}$ inch long, occur singly in the axils of the leaves which are divided into three leaflets. The roots are long and tough, and the name of the plant may originally have been "arrest-harrow" on account of it being an



CROOKED YELLOW STONECROP. *This bright yellow flower grows in profusion on walls and stony places. Here it has seeded itself in the crevices of a tiled roof. It is a hardy plant and grows well into the late summer and autumn.*

obstacle to cultivation. Flowering will continue until August. In a similar situation bird's-foot trefoil occurs. This is also of the pea family, with stems up to 12 inches long and long stalks terminated by clusters of 3-10 yellow flowers which may be tinged with red. Among children it is sometimes called "eggs and bacon". The seed-pods spread like a bird's foot—hence the common name.

Yarrow or milfoil blooms in pastures and waste places. It is of the daisy family. The composite flowerheads are about $\frac{1}{4}$ inch across and have yellowish disc florets and white or pink rays. These small heads occur many together in flat clusters more than 2 inches across. The stems, up to 18 inches high, are leafy with feathery dull-green leaves.

Tutsan or park leaves, is a handsome

St John's-wort which flowers this month in woods and other shady places. The stem is woody, erect, 1-3 feet high. Stalkless egg-shaped leaves up to 3 inches long, grow opposite each other. Holding them up to the light, we find they have a sprinkling of translucent spots. The few attractive yellow flowers, each about $\frac{3}{4}$ inch across, form terminal clusters. This handsome species is not too common.

The stately foxglove may show some flowers this month, but its greater glory will be seen later, from July to September. We look for it on banks and in copses. It does not like chalky soils.

In boggy places the butterwort may be looked for; it is always of particular interest because it catches and digests insects. Its pale-green leaves form a rosette, and have glands which secrete a

ticky juice. Small flies are held by this and other glands secrete a digestive fluid which makes broth of the captives and the broth is absorbed for the nourishment of the plant. The deep-blue violet-like flowers are borne singly on leafless stalks. Sundew, another insect-eater, will flower in July. It also grows in boggy places. Its stalked leaves with a reddish tinge form a rosette: they are covered with hairs tipped with glands from which a sticky fluid oozes, securely trapping the unfortunate fly which alights upon the leaf. The hairs turn over to the trapped insect and soak it with a digestive fluid. The flowers are small, white, and form one-sided clusters on leafless stalks from 2-6 inches high.

On old walls and rocks the wall pennywort shows spike-like clusters of tubular yellowish-green drooping flowers.

The leaves, however, are the more noticeable feature. They are round, like a penny, with scalloped margins, and fleshy. The stalk is attached to the centre of the underside of the blade and above, at the point of this attachment, there is a depression like a navel. This feature has suggested another name—navelwort. In a similar location one may see the English stonecrop exhibiting its clusters of starry 5-petalled white flowers spotted with red. The tufted stems are up to 3 inches high. The leaves are small, succulent, crowded together. This charming sedum occurs mostly in the west, particularly near the sea, and it is not nearly so commonly seen as the yellow flowers of the biting stonecrop, which are to be found in profusion on old walls and in other dry places practically everywhere in the British Isles.

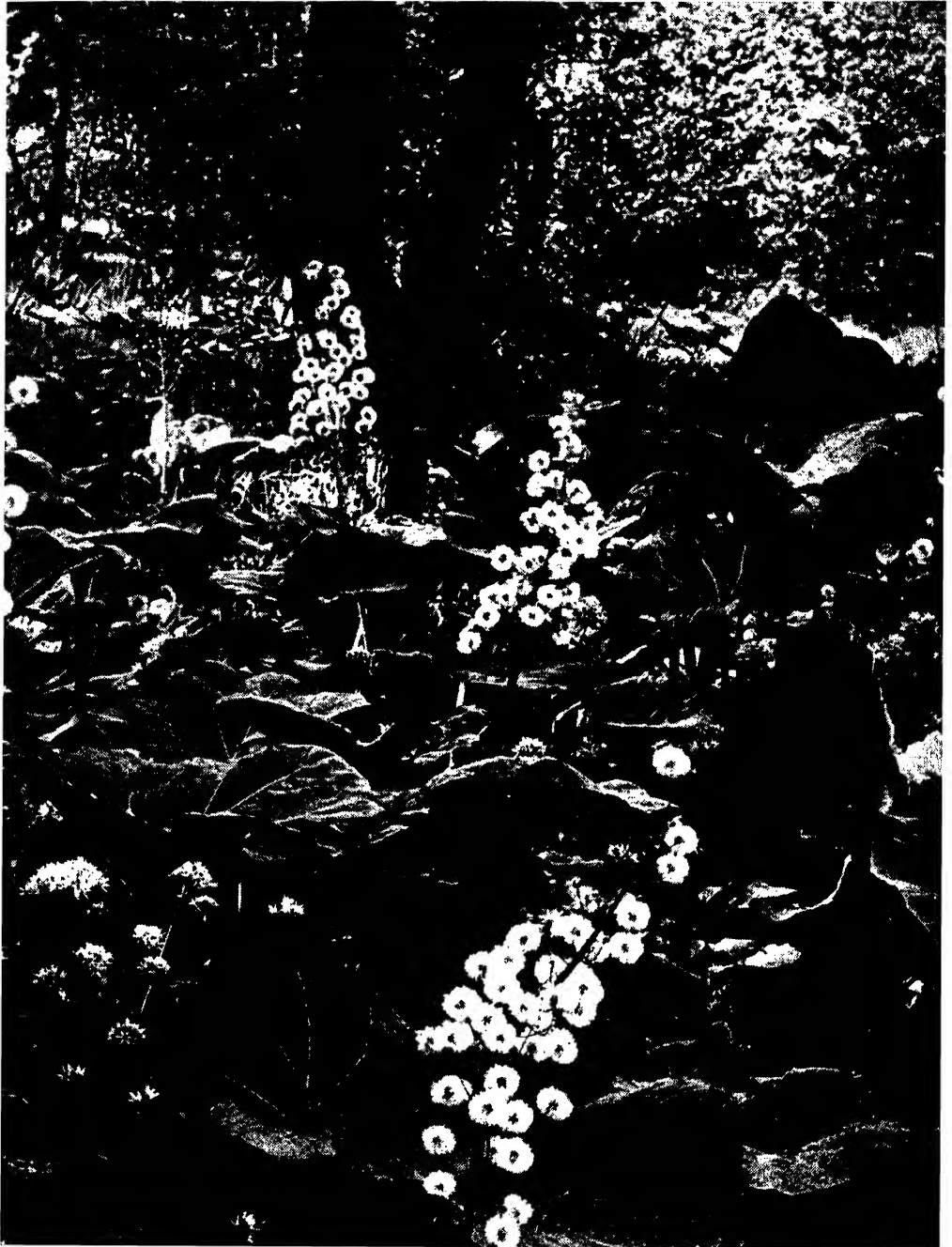
SEDUM ACRE OR WALL-PEPPER. *A low creeping evergreen with tiny leaves. The flowers grow like little yellow stars and the plant spreads into a tapestry-like carpet, especially on loamy soils or in open sunny places.*





TRAVELLER'S JOY OR OLD MAN'S BEARD. *This climbing plant belongs to the clematis family, and as its name suggests is to be found in hedgerows and waysides; its silver beard is a familiar sight in every country lane. A lover of chalky soils it climbs in rambling masses over upright shrubs and low growing trees.*

BUTTER-BUR. *These flowers are often to be found in meadows and on the banks of streams where the soil is sandy. The leaves grow to a considerable size, sometimes as much as 3 feet in diameter. In this picture the flowers are going to seed and have already grown to a considerable height. The butter-bur is a perennial.*



Wild plants bursting into bloom in July are not so numerous as those which begin to flower in June, yet they make a goodly show and add considerable variety to those of former months which continue to flourish.

July Flowers

Our only native clematis, traveller's joy, clambers over the hedges, holding on by means of twisting leaf-stalks. The flowers grow in stalked clusters. They are about $\frac{3}{4}$ inch across, without petals, but the greenish-white sepals resemble petals. In autumn and even in winter the feathery fruits make a shaggy display on a hedge—hence a fanciful name for the species, old man's beard. The rose-bay willow-herb is conspicuous on banks, in open spaces, in copses and even on refuse dumps. Its tall stems with willow-like leaves are terminated by long spike-like clusters of rose-coloured flowers and masses of the plant over a

PERFORATE ST. JOHN'S WORT. *The hedgerows are bright with these many stamened yellow flowers throughout England and Wales from July to September.*



considerable area make a very pleasing sight. A near relative, the great hairy willow-herb, or codlins-and-cream, with stem and leaves softly hairy and scented rose-coloured flowers, likes moist places, such as occur by ditches and riversides.

Another plant of moist places is purple loosestrife. It may be up to 5 feet high. The purple flowers, about 1 inch across, with violet or yellow anthers, are clustered in the axils of the leaves and the ensemble is a long, leafy spike. On river banks yellow loosestrife imposes itself on the attention. It is not related to the previous species, but is of the primrose family. The stout, erect stems are up to 4 feet high. The stalkless egg-shaped leaves are 3 or 4 in circles round the stem and branches, and the delightful bright-yellow flowers occur in clusters in the axils of the leaves and at the top of the stem. This plant is rare in Scotland. By ditches and in other wet places we may see gipsywort with its square stems bearing deeply-toothed lance-shaped leaves and with little white 2-lipped flowers densely packed in whorls in the axils of the oppositely placed leaves.

Bramble Flowers

In hedges, copses and other places the bramble or blackberry, scrambling all over the place and holding on by its prickles, displays its white or pinkish flowers from which will come the fruits to be gathered in September. The dewberry occurs in thickets and hedges and waste places: it is a variety of bramble producing fruits with a blue bloom. The sepals close about the fruit and the drupes composing it are larger and less numerous than is the case with the common bramble. By the hedge, and also in the fields, upright hedge parsley adds its distinction to the scene. This plant also produces umbels of small flowers which in the cluster make a big show. It is of slender, rather elegant growth, up to



HARE-BELL. *This is the true blue-bell of Scotland; the blue-bell of the south is the wild hyacinth. This delicately drooping blue flower sways with the slightest breeze.*



3 feet high. The white flowers have a pink tinge. The fruits are covered with incurved bristles without hooks. The hedgebanks also display perforated St. John's-wort, a cousin of tutsan mentioned on p. 62. Its stem is up to 18 inches high, branched in the upper portion. The leaves are small, stalkless, and have translucent spots. The numerous yellow flowers occur in small clusters at the end of stem and branches.

Wood sage also grows in hedgerows, and in copses and heaths. It has wrinkled leaves like the sage of the garden and small 2-lipped pale-yellow or greenish-yellow flowers in pairs, forming one-sided spike-like clusters. The plant has a very bitter taste and at one time was used in brewing; it is still used medicinally by herbalists.

Yellow toadflax brightens waste places with its spikes of spurred personate flowers resembling those of the snapdragon. The flowers are lemon-yellow with a touch of orange. Yellow fleabane may be seen by the hedge if the ground is moist, for it likes moist places. This is of the daisy family, with large heads composed of many yellow disc florets and some rows of yellow strap-shaped rays. It is made conspicuous by its soft pale-green stems and leaves, which are very woolly. Though abundant in England, this plant is not common in Scotland.

Blue-bell of Scotland

An increasing glory of the month is the hare-bell—the blue-bell of Scotland—which now begins to exhibit its azure-blue bell-like flowers in pastures and on heaths, and will continue to bloom through September. One wonders how so seemingly delicate a plant can flourish in a situation where it is buffeted by every wind that blows. In similar localities the devil's-bit scabious flourishes abundantly. Its flower-clusters are smaller than those of the field scabious (p. 61). The small

purplish-blue flowers are in compact *round* heads, all being of equal size and form. The heads terminate long stalks.

Black knapweed or hard-heads, has round composite flowerheads with purplish-crimson florets, the complete head being enclosed by an "involucre" of fringed brownish-black bracts so compacted as to give a sense of hardness. The species is very common in fields and pastures and by roadsides. Great knapweed or centaurea, a closely related plant, is of somewhat stouter growth, the outer florets of the head are larger than the inner and form a kind of ray. The bracts of the involucre have a brown fringe.

Chicory for Coffee

One of the loveliest of our wild blue flowers is chicory or succory, occasionally to be seen by the roadside, in waste places and cultivated ground, especially on chalk. Only very rarely is it seen in Scotland. The stem is from 1-3 feet high, furrowed, angled, rough. The flowerheads, consisting of bright-blue florets, are about 1-1½ inches across and occur in the axils of the leaves. The lower leaves are like those of the dandelion. Cultivated chicory, used as coffee, has been developed from this plant. On the moors and heaths, heather or ling is the dominant July flower. The plant is shrubby, with branched stems up to 2 feet high. Minute description is not necessary, as everybody knows the species; the main point to be noticed is that the pink flowers (only occasionally white) occur in spike-like clusters. Not so abundant, yet common, is bell-heather or fine-leaved heath which has dense clusters of urn-shaped crimson-purple flowers with small mouths, terminating stems and branches. The small, linear, pointed leaves occur usually 3 in a whorl and in their axils are clusters of smaller leaves. Cross-leaved heath is also common: it has terminal one-sided

clusters of rose-coloured bell-shaped drooping flowers, and narrow leaves arranged crosswise in whorls of four.

Turning to boggy places on the moor, we note the delightful little bog asphodel which gives brightness to what is perhaps an otherwise sombre scene. This is of the lily family, a plant with tufts of short linear leaves at the root and starry bright-yellow flowers, each about ½ inch across, arranged spike-like on a stem up to 12 inches high. The orange anthers of the stamens add to the charm of the flower.

In nearly every waste place the spear plume-thistle holds up its defiant head. It may be 5 feet high and the strong spines tipping the leaf lobes are a formidable defence against attack. The flowerheads are up to 1½ inches across. The many florets they include are dull-purple. The scales about the head have spines at their points and are woolly and spreading. This is not a pleasant plant to handle for every part is barbed.

August Flowers

Although the fields are ready for harvest in August and the year is on the wane, quite a number of our wildlings come into bloom in this colourful month, and many which opened flowers earlier continue to do so.

Among the corn, and perhaps reaped with it, is the rather stately corn sow-thistle, of sufficiently tall growth to avoid being smothered by the ripening crop. This is a much more attractive plant than the common sow-thistle which is gathered for rabbit food. The composite flowerheads, which form terminal clusters, are large, up to 2 inches across, and composed of numerous strap-shaped florets of a lemon-yellow colour which makes a peculiar appeal to the eye.

In copses and by hedges the wild teasel produces its large heads of very



YELLOW LOOSESTRIFE

small lilac flowers. Each head is surrounded by long spiny bracts. The plant is up to 6 feet high and has an erect angular, rigid, prickly stem, and long, stalkless, lance-shaped leaves growing opposite to each other. The upper leaves are joined at their bases and form a sort of cup which holds water. Insects drowned in the water are partially dissolved in it and the leaves send out fine filaments, like root-threads, which absorb the resultant broth.

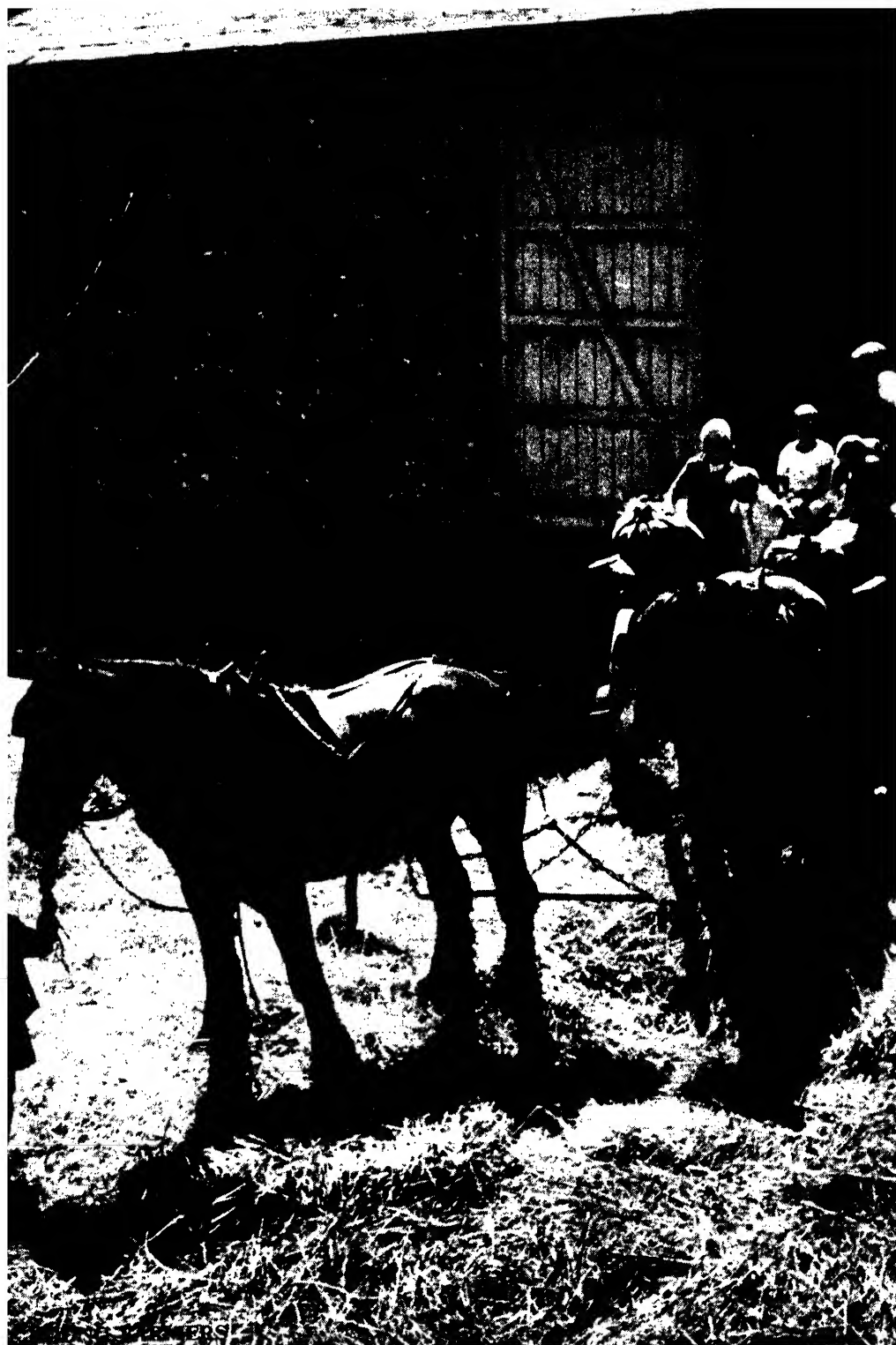
In waste places and pastures the autumnal hawkbit abounds, bearing deep-yellow flowerheads on branched flower stems up to 18 inches high. These heads comprise strap-shaped florets on the dandelion principle, each head being about $1\frac{1}{2}$ inches across. The leaves, deeply lobed or sometimes only toothed, all spring from the root and form themselves into a small rosette. The hedgerows are becoming bright with autumn fruits; blackberries are to be seen in every stage from bud to berry. Hips and haws add colour to the scene.

With the coming of autumn, few wild flowers make their first appearance, though many that came into bloom during the summer months continue until the cold weather. An exception is the ivy, which puts forth its flowers for the first time in October—small, greenish-yellow ones with 5 small sepals and 5 pointed petals. These are arranged in umbels growing on stems branching out and away from the climbing stems to give the flowers the maximum light and air.

As the year grows older, ripening fruits of holly, mountain ash and dog-rose and the orange-pink of spindle, touched with early frost, take a yet more glowing tinge. These share the gold of falling and fallen leaves and the rich hues of fungi and contribute to the glories of the autumn woodland.

If the autumn frosts are not too severe December may bring the first signs of spring still far off but not quite out of sight. Nature is stirring even when she appears to be asleep.







THE FARM

ON the farm to-day, one is conscious of Nature moving in a cycle. There is no longer that sense of supreme anticipation in spring, for now there is anticipation all the time. The naïve and beautiful celebrations with which our forefathers greeted the spring were provoked by the relief they felt after the anxiety of winter in which cattle and horses starved and men went hungry. Science, following up the work of a few pioneers, has made possible the growing of much earlier and later grasses, and the taking of more luxuriant hay crops from temporary swards. The introduction of roots and kale into the farming rotation has also revolutionized our attitude towards winter, for cattle are now as well fed during the dark days as they used to be in the spring and summer of our forefathers.

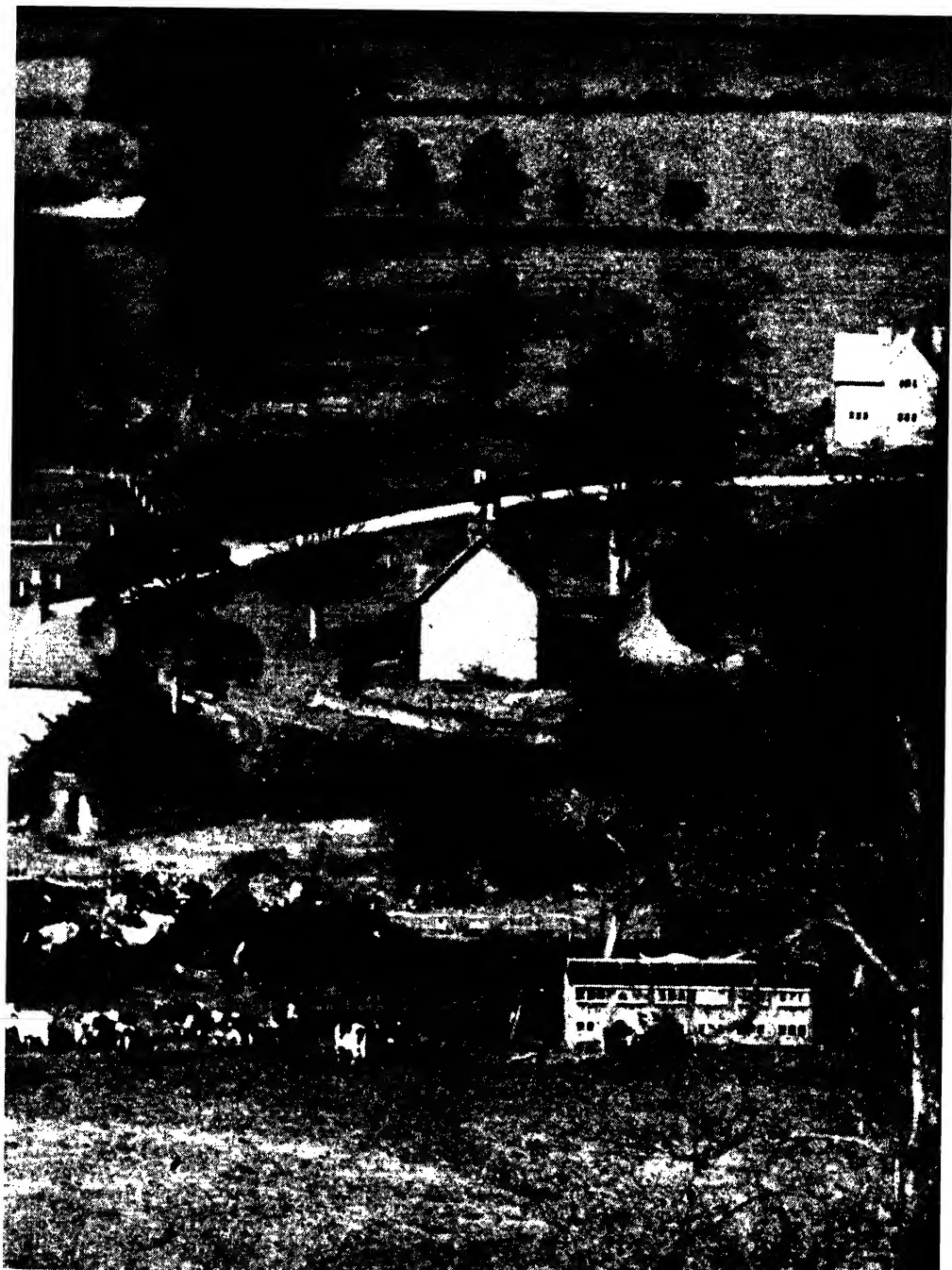
Nowadays the farmer is sowing and harvesting all the time. The year is always looking forward; the season of sowing hardly ever ends; there is seldom a month in which the farmer does not walk into one or other of his fields and stir the soil with his stick to see if his newly sown seeds are germinating.

Where, then, in writing of Nature and the soil of farming, should one properly begin? There is no beginning and no ending; and this is true of Nature herself. In the climate of our island she never sleeps, but is always stirring. Winter is not a death, or even a sleep, but a by no means unrelieved pause in growth. We anticipate spring in September when we sow our beans and oats, in October and November when we sow our wheat and even up to Christmas wheat has been sown which yielded a good crop. Then in February, on the light land, the seed drill is out again, sowing spring oats. March, April, May—barley, kale, swede and mangold seed goes in; June, and it is time to sow turnips, and July turnips again; in fact all through the summer, even to early August, whenever there is a propitious shower, someone is hurrying to sow turnips and hoping they will grow quickly enough to outstrip the flea-beetle, known popularly as “the fly”, which preys on the first two leaves of the seedling.

The reaping and gathering of crops which once was a seasonable fixture,



PICTURE OF A WELL-PLANNED FARM IN WARWICKSHIRE. *The planning and the arrangement of farm buildings on a farm is of considerable importance both for the convenience of the farmer and his farmhands, and for the comfort of his livestock.*



Adequate grazing should be possible not too far from the cowsheds and with a certain amount of shelter and water available. Here we can see the farm-cottages, barns and other necessary farm buildings grouped conveniently close without overcrowding.

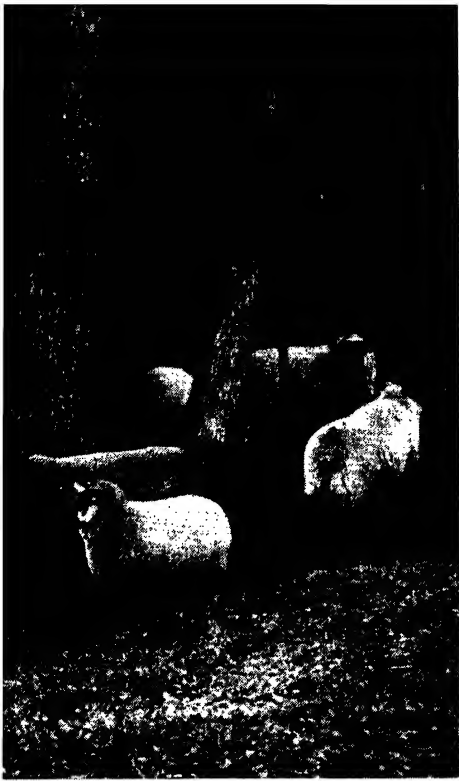


likewise is no longer confined to the traditional harvest months—grass grown on temporary leys may be cut as early as May and dried artificially or made into hay, and all the following months till the end of the year sees some crop being gathered; the last to be lifted is the sugar-beet, which is not always completed till the year is out.

This is modern farming and shows how the farmer, aided by the scientist and the engineer, has tapped the unwearying energies of Nature, and has canalized them for the betterment of humanity and of the animals under his care. The range of the farmer's preoccupations has likewise enlarged; he is concerned both with the earth-moving machines that have given him power undreamed of by his forefathers, and with the micro-organisms whose unseen work in that same soil is the basis of its fertility.

The farmer is occupied in *managing*

Nature: he lives in a world of power and it is the power exerted by Nature which fascinates him: would it be too much to say that he admires and regards Nature as he does engineering? But superb engineering—whether it be the neat, highly-charged unit of a berry of wheat, or the build of a plough-horse? When you see him running his hand down the legs of a horse, or looking at its teeth, or poking his stick up the outlet of a drain, or trying a cow's udder, do not think it a pity that he is missing all the finer touches of Nature—the light on the clouds, the flowers and the birds' songs. He is concerned with the anatomy of living, and those of us who are able to wander the country with a detached and appreciative eye, do so, we should remember, by reason of that man's preoccupation with a less immediately conspicuous side of it; for it is he who provides the food, and it is only by such



SHEEP GRAZING IN WINTER. *During the winter months the farmer can always find some suitable grazing for his sheep. They can pick up adequate nourishment even in frosty weather.*

noticing any fault in the set of traces, collar, and couplings between horse and cart or plough. When the tractor came on the scene, those principles still applied, only in a new way, and he quickly understood and adjusted his technique. The horse is a useful and noble animal: the tractor is a useful machine; that is the difference.

Dispersal of Weight

Farming depends on the hoof and the wheel, as gardening depends on the spade and fork. But there is one other principle involved, common to both farming and gardening—dispersal of weight. This is a most important matter, for which the gardener has a very simple device and the farmer a fairly complicated one. In the first case the gardener has a plank of wood, this he pushes on to his garden bed in the early spring, when he wants to sow or plant in the moist earth without stamping it into a mire. He stands on it, and his weight is so dispersed over the whole plank that the earth is very little depressed. The plank in modern agriculture is the track-layer of the caterpillar tractor. This does less harm to the delicate soil structure than the wheel or the hoof. The wheeled tractor may already be, in effect, obsolete. There is comparatively little uncultivated land in England to-day for wherever wheel, hoof or track-layer can penetrate there also the ground can be cultivated.

Is wild Nature doomed in England then? In his book of rural rides called *Farming Adventure*, Mr. Wentworth Day describes the draining and taming of some of the last remaining fen land in East Anglia—not without regret. He

unremitting application of body and mind, that food in excess of the requirements of the grower is produced. This may give a clue to "Merrie England", when there was no industrial population to be fed. In those days, when a man had grown enough for his family he had finished his work, and had about a third of the year to spend in holidays, or holy-days as they then were.

Harnessing Energy

First, let us rid ourselves of the idea of Nature versus mechanization on the farm. There is no dividing line in the farmer's mind: farming is in itself mechanics applied to Nature. The farmer has long understood the principles governing the application of power and how best to harness energy. First he harnessed the ox and the horse. He bred the horse into being an agricultural machine; and he has a trained eye for



describes the old rough tracks through a wilderness of sedge, the pools among the reeds which were the haunt of wild fowl unknown in other parts of England, and of the rough, hardy race of men who inhabited that waste land. They were by no means model citizens, but had an individuality not apparently bred by more ordered ways of life. In a phrase, the wild fens were rich in sheer being, though not of a kind useful to modern civilization.

For the farmer the taming of Nature is a full-time job, particularly when he goes out to prepare his various blades for the battle of the spring. In autumn he had things his own way: he could sow, and see what he had sown come up in neat rows, with dark earth between. But after the spring sowing what comes up? Nature's is the more prodigal hand; she sows between the rows as well as within the rows, and her children have a vigour in excess of the





PLOUGHING AUTUMN AND SUMMER.

During spring, summer and autumn the plough is out in the fields preparing the soil for new crops. In the top picture the hand plough is being used. Many farmers still prefer to walk behind the plough and on small farms this method is often an economic necessity. Horses trained to farm work are almost mechanical in their work, plodding up and down the furrows practically as evenly as the tractor plough. In the bottom picture a field of grass is being ploughed up preparatory to taking next year's crops; the tractor-plough has made a comparatively short job of one which, a few years ago, would have been considered a major undertaking. It is interesting to see that the seagulls are unafraid of the tractor-plough and pursue the noisy engine as closely as they would the silent horse-plough.



cultivated plants. The more we grow the more we must hoe, so even before he has sown his spring crops the wise farmer is looking over his various hoe-blades and ordering new ones from the blacksmith to replace those damaged.

Spring Activities

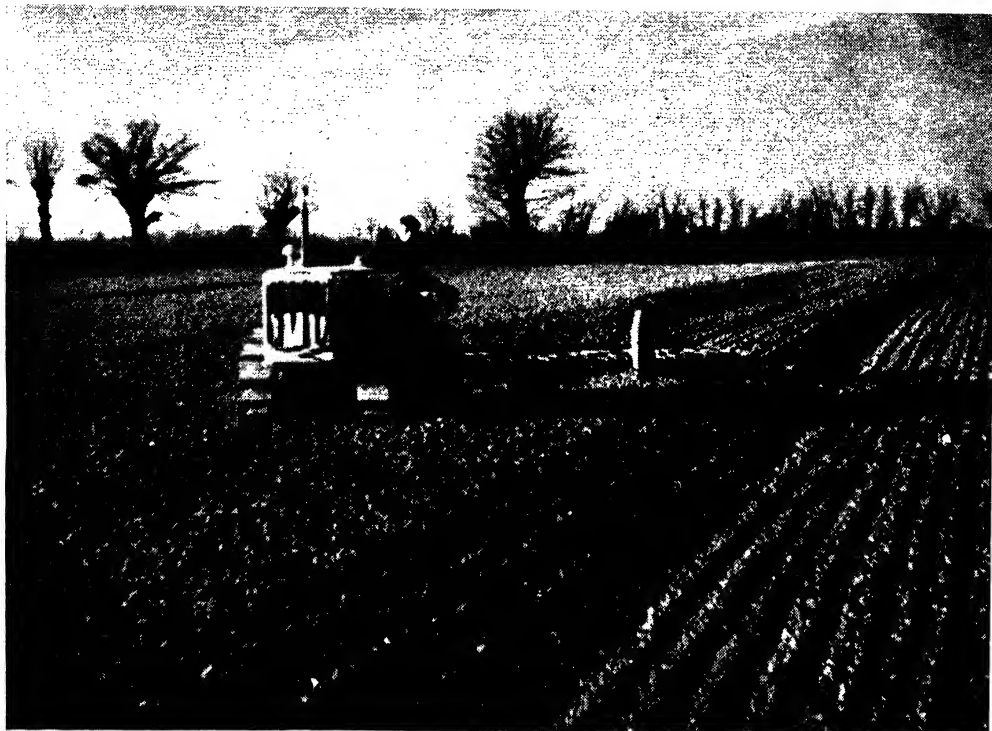
Spring is proverbially a restless time, when people are filled with yearnings for change and travel: the farmer's yearning is to harrow his winter wheat, his beans and the furrows of his autumn ploughing. The keen gardener will understand how work to the farmer is a passion far greater than any desire to roam abroad or make pilgrimages. He does in fact travel many miles—up and down his fields, harrowing and sowing and hoeing, in the spring season. First the wheat must be harrowed in order that the crust of soil may be broken, even the roots tugged a bit so that they are aerated and encouraged to spread. The plant does not immediately shoot up with new growth as a result of this, but lays itself flat to the ground and "runs". This is a good sign and indicates health and vigour. There are pleasant hours to be spent in the spring, harrowing, once you have started.

But to achieve that start. Where are the harrows? Not surely still in the field where the last of the winter wheat was sown? One of them is on the roof of the hay-stack, where it was hastily laid in a gale to save the thatch of the eaves. A horse must be harnessed for shafts, backed into the cart and led to where the harrows are. The harrows are loaded into the cart: harrows are perfectly designed for becoming immovably embedded one upon the other, teeth interlocked, by the mere process of jolting together for a few hundred yards in a cart. Slowly, then, they and their whippetrees are drawn to the field; there unloaded and laid out correctly, and hitched together.

Then the horse must be led back, taken out of cart and into stable, cart-harness taken off and plough traces put on, as well as on another horse who is to harrow with her. They are led out and hitched on to the harrows. There is a right and a wrong order of doing this; put the reins on first, hook the harrows on second. The whole ordering of the harnessing of a horse and attaching him to and detaching him from an implement is governed by the contingency of his running away. The last things you detach are the reins, not the chains.

Harrowing does Wonders

So at last, having the horses rightly spaced apart and the reins adjusted accordingly, you can begin your harrowing. Then comes the pleasure of it, the sight of the earth breaking and darkening behind the teeth. You look back from the headland, and the rows of wheat look twice as green, twice as vital, against the darker background. It is as though they have actually been brushed awake from a winter's sleep and all in a minute have started into growth. The wheat looked grey and unhappy before, and thin. None but the farmer who knows the way of that heavy land, could believe that it would be worth the harrowing. Better plough up and sow again, they would say. But no, harrowing will do wonders. By dinner-time the field has been harrowed once, and a hundredweight per acre of nitrogen in the shape of sulphate of ammonia scattered over it. After dinner the wheat receives even more drastic treatment. It is harrowed a second time, but instead of the teeth running along between the rows, they run across the lines of the drilling. At the end of the first journey across the field several of the tender wheat plants are adhering to the teeth, having been wrenched up bodily. Looking back, you see that many of those



HARROWING LAND AFTER DRILLING SEED. *When the fields have been drilled, the harrow and roller are brought out to redistribute the soil which has previously been displaced by the drilling machine. In this picture the harrow is attached to a tractor.*

remaining have been covered by earth. The teeth of the harrows, having first broken the crust, hook in more deeply this second time. The farmer views this sight not with misgiving, but with satisfaction; he is being cruel to be kind. He cleans the young wheat plants off the harrows and starts again across the field. Now, with a free mind, he can listen to the birds singing, and observe the palm-willow in blossom in the spinney. More often his eyes wander to his neighbour's fields and note other horses and harrows at work. A train passes right under the noses of the horses as they stand at the headland by the railway cutting. They are used to trains and do not stir. Faces stare out of carriage windows in that desperate ennui of the last lap of a long journey. "This is your bread I am walking on", says the farmer

to those faces, "though it doesn't look much like bread yet". It looks more like a few thin blades of grass. And somehow that is an exhilarating thought as one treads to and fro on the firm soft carpet of spring earth, with horses and harrows—that it is the people's bread one is at work on. It is a long journey: it will be a longer journey to harvest, but at the end of the day one short stage of it is completed, leaving an apparently mutilated field as the result. But there is satisfaction in the farmer's mind as he enters the dusk of the stable with his team, and gives them each their sieve of chaff with crushed oats and bean-meal scattered over it. The tractor unfortunately can express no satisfaction in having oil poured into it and its joints greased. It is an inanimate ally, like the scythe and the plough. But to watch one's



FERTILIZING. *Before the spring sowing the fertility of the soil has to be renewed by the scattering of nitrogen and phosphates, which provide the essential chemicals needed by the growing crop. Here a farm worker is seen scattering lime on a field.*

horses eagerly nosing in the manger after a hard day's work which you have shared, is a peculiar pleasure of the husbandman's.

Not the least of the farmer's problems is the settling of the order of the many jobs to be tackled at the spring-time of the year: oats and barley to be drilled—which means phosphates or nitrogen or both to be sown first, followed by several harrowings and rollings. Unless he has a combine drill, which is unlikely, the fertilizer must be sown by hand, exactly as our forefathers sowed corn, and this takes time. You may reckon that the operation of sowing is just twice what it was—first the broadcasting of fertilizer, then the drilling of seed. There is an idea that chemical products are somehow “unnatural” or artificial in a way that

earth and vegetable matter are not. Take that which is called “sulphate of ammonia”; one's immediate reaction to that term is in the nature of one's reaction to a cold draught let into a cosy room. Quite the opposite to the feeling engendered by such words as “scythe”, “hay-wain”, “wheatsheaf”—but, nevertheless, sulphate of ammonia is a vehicle of nitrogen, which is a great part of the very air we breathe.

So we sow this spring elixir, wisely and moderately, knowing that all magic works both ways, and in the hands of the uninitiated can deal death as well as life. In sowing it we harness to ourselves the seed-lip of our forebears, or an old pail which serves as well, and fall quickly into the immemorial rhythm of the sower, suiting the hand to the pace according

to the amount per acre to be sown.

Now, too, we have other manure to apply, that farmyard dung which is the basis of all fertility. After a winter of treading by cows and bullocks, the yards are raised several feet by a compact layer of dung-rotted straw. A whole straw-stack may have undergone this essential metamorphosis, a change appreciated by the man who maybe himself built, first the wheat-stack last harvest, then at threshing time the stack of threshed straw from it. After the threshing-machine had gone, there stood that stack, a giant of the yard, the lonely visible residue of a year of field labour bulked up by its lightness and shining brightly, as yet unweathered. And load by load it was taken and spread in the yard, and each day when it was carted there, the cattle rustled about among it, and rested in the new cleanliness of it. And in a few days that layer too was discoloured dark and dank, and a fresh layer laid down. Now it is carted out, black and short and heavy, to nourish another crop. Hard work, this dung carting; it is good to rest a minute between the departure of a full cart and the backing into position of an empty one. And when at last all is done and the yard cleared—it is not done, for all the while we have been forking into carts, the man in the field has been laying it out in heaps, and now all these heaps must be spread before we can proceed any further toward the sowing of the field. That field is to be of roots: mangolds, swedes and turnips—the very things on which the cattle are now subsisting. While they eat last year's roots we prepare for this year's supply. So another goal in the farming year is before us. "If only", the farmer says, "I can get that manure spread and ploughed in by the week-end——" Farming is like that; every week has its target, attained with satisfaction or missed with regret—by bad weather,

bad luck, or an error in judging priorities of work. The root crop receives the bulk of the farmyard manure, which will be the foundation also of a crop of barley on that field next year. So it is coats off again, and the pattern of little black heaps melts before the busy forks. This field is bounded by clean ditches and hedges cut to the ground, which are sending up tender shoots from the stubs of hawthorn and wild rose, whose stems are pink and juicy with thorns not yet firm enough to prick the flesh. These ditches, with the pipes that lead into them, are part of the intricate engineering of the farm, each one dug to a certain depth and breadth according to the number of land-drains that flow into it, and the amount of water it receives from other ditches. This ditching is by no means a job of simple digging; the levels must be constant, the sides sloped and plastered with the wet clay to prevent them falling back into the ditch.

Back to Nature

But at the south side of this field of manure-heaps, there is a high wild hedge, and from beyond that hedge nightingales sing all day, along with wrens, thrushes, warblers. There are twenty acres yonder which have returned to primitive wilderness during the lean years of farming. Old men remember them as good corn land. Being far from the homestead, they were laid down to grass, but grass, unfarmed, does not remain as grass for Nature, left to herself, begins her own cropping rotation. Grass is displaced by rest-harrow and thistles and weeds armed with spike and sting and ill-flavour, such as ragwort, and unfortunately these flourish, as cattle avoid them; only sheep will bite them down in their early stages, ere the thorns are old enough to become unpalatable. Next, little clumps of bramble appeared, then hawthorn. Now, that twenty acres is a

fair specimen of what was known to our ancestors as "wastes", the virgin land between open field and village, through which travellers penetrated by little-known paths, often in peril of their purse or lives. The twenty acres is now so thickly set with hawthorn bushes that cattle can only just make their way between them, treading carpets of primrose and violet. Already stalwart young oaks are advancing from the hedges into the fields, and Nature's final crop, the primeval hardwood forest of England, is well on the way. So corn-land becomes grass, and grass becomes rough grazing, and rough grazing becomes rough shooting. One day all this land is to be reclaimed; the thicket cut down, the roots dragged out, the land drained, ditched and ploughed: all this with great labour yet a little attention from time to time would have kept in cultivation. Meanwhile if you forget to be a farmer—it is beautiful in its wildness. Step through that high hedge, become the bird-watcher, the pilgrim, the contemplative, the hermit. The thorns are a mass of white and pink may; birds flit from spray to spray, scattering petals as they go. "A fairy land", says one sense, while "disgraceful dereliction", cries another.

Making a Clearance

When all is cleared away there will be no more nightingales' songs to sweeten our muck-spreading. We spread and spread, scattering the heavy stuff from our forks.

The next day we take the horses to plough, and step out the stetches exactly, ten yards to a stetch, five from the headland; there the first ridge is to be set. Peeled sticks are set up; the coupling trace lengthened between the horses so that the sticks can be seen between them. How much it means; that first straight (?) opening furrow.

After the manure is ploughed in, the phosphate is sown. Already the kale has been drilled, and we bend and look anxiously for the first seedling. The phosphate sown, enough to whiten us and make the black ground look grey, it is harrowed in. Harrow, roll, harrow; at last we have a tilth. Different varieties of mangolds are discussed—Gold Tankard, Red Intermediate, New Century. Specimens are taken from our still considerable mangold clamp and compared

Feeding Cattle

The mangold becomes the mainstay of the farmyard, now that kale and swedes and turnips are consumed. April can be a difficult time for feeding cows, if spring is late. The cows overtake the growth of early bite, yet the succulence of the grass spoils their palates for the dry winter fodder. The mangold is both succulent and nourishing in the spring, but too cold and watery for mid-winter use. Thus a dry, well-thatched clamp is essential, and we look forward to having sound mangolds for use even in August. The horse-keeper selects the best roots, cleans them carefully with his jack-knife and carries them to the stable.

In drilling mangold seed, it is important that the rows should be correctly spaced, for the horse-hoe is to follow, cutting close to the seedlings on either side. The seed drill is, after the plough, the most important implement on the farm, with its telescoping funnels of tin leading the seed down to the pointed counters furrowing the earth, and its geared spindle of little revolving cups. If anyone needs a training in watchfulness, let him walk behind the drill. If he has failed for a minute to notice a blockage or displacement, his oversight will be written on that field for all to see, a blank row where a line of seedlings should be. Before drilling the roots, it is necessary to remove a number of



THATCHING A BARN

counters, leaving only four, and these must be exactly two feet apart. The horse-hoe blade is sixteen inches. This leaves four inches margin on either side of the seedlings, which seems ample, but proves to be remarkably little when one is actually guiding the hoe between the rows. There is a great deal of mathematics and measuring of this sort in agriculture. It is remarkable to what order the husbandman can bring his work within peculiar boundaries and contours. Not the least awkward are fields which railway lines intersect, leaving perhaps a two-and-a-half acre triangle to one farm and the rest to another.

The roots having been drilled and the land left pressed upon the seeds by the flat roll, the better to conserve moisture and absorb a shower, we next turn our attention to sowing seeds of grass or clover in the barley, or a mixture of both. Properly speaking, the barley and the grass seeds should be sown directly after each other, but it is not always practicable to do this. These clover seeds will convert the stubble from which the barley is harvested, into a sward of succulent green by next spring, which will be cut for hay, then broken up again to be ready for a wheat crop. The clover roots restore to the soil both humus and nitrogen. Sometimes in a showery summer, the clover grows up into the barley, which makes it more difficult to harvest, but once harvested makes the barley straw equal almost to hay as a fodder for bullocks.

Sowing Grass Seed

Twenty pounds of seed to the acre! Imagine yourself standing in a five-acre field, with about a hundredweight of grass mixture seed in a bag at your side, a half-peck measure in your hand, and a bit of a breeze blowing. You are to sow that hundredweight evenly over the five

acres. It is something of a problem, with the breeze winnowing the lighter seeds from the heavier. But it is only one of the multitude of tasks that the experienced land-worker does and does well.

There comes a dry period after the corn and grass seeds are sown, and the rooks make holiday at our expense. Their beaks scoop holes in the loose dry earth like those made with a trowel. One erects a scarecrow to gain a day or two's respite. There is another thing, though, that is more efficacious; it is the simple expedient of stretching several lines of string across the field, attaching the ends fairly high up to trees, so that the string at its lowest point is still well above the ground. For some reason these strings terrify rooks; they come sailing over the trees, then turn and make off, croaking wildly, as at sight of a gun.

The Flea Beetle

A more insidious enemy, though, attacking the young kale, is the flea beetle. It is like this. On Saturday morning you go and look at your kale, and see long rows of seedlings and say to yourself "Good, an excellent take". Sunday is warm and sunny; on Monday you look at your kale again; it has vanished. Bending low you can see here and there the remains of your crop; a few seedlings whose leaves are pitted as with a sort of pox, and if you touch them you will see tiny insects jumping from plant to plant. So you must bring out the drill and sow the kale seed all over again. This time a shower comes at the right moment, and the seedlings are able to make a spurt and grow their second pair of leaves, which the flea-beetle rarely attacks. It is only the first pair of seedling leaves that these insects devour, and it is a mystery to the farmer where they hide and what they subsist on for all the rest of the year!

Now we are getting anxious about our newly-sown grass seeds: after a frostless winter there was not a very good tilth for them. We did what we could, but the surface was still covered with small "cobbles" of earth. The seeds fell in among these; the shower came and now, doubtless, they have just started to germinate. If the land dries out again (as it will do in one day of full sun), they will parch and die. These little clods or "cobbles" are just sufficiently moist to crumble, but not so moist as to stick to the roll. Now, this morning, is the time to crush them down upon the germinating grass seeds to conserve the moisture round them. By this afternoon they will be hardened again and it will be too late. Let us make haste and fetch the flat roll. But alas, as we go to lift

the shafts, we find that the tractor-man, who was ploughing the field by the stack-yard, has run over them just where their tips lay buried in the grass, and they are broken off short. Impossible to get them repaired in time; it looks as though the grass seeds are doomed. But wait a minute; at the back of the barn lies a century-old forgotten tool—a wooden roll, made from two segments of the trunk of an oak tree, bound with iron rings at the ends, and set in a wooden frame. It was known as a "barley roll", because years ago farmers would not let iron touch their young barley; the wood, they said, was "kind" to the tender blades. We fetch out the old wooden roll and piece it together. It seems to revive an old simplicity of life. "What else did they have years ago, but

PLANTING POTATOES IN APRIL. *The potato grows particularly well in sandy loams but it responds markedly to proper cultivation and a reasonable crop can be expected wherever a good tilth has been made regardless of the type of soil available.*





THRESHING & PLOUGHING



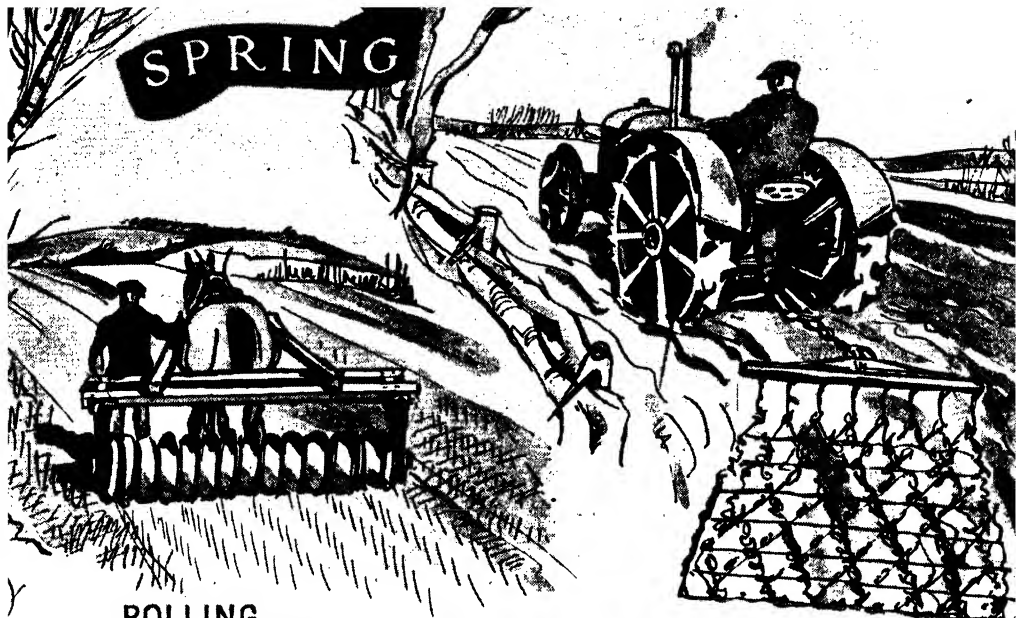
SOWING WINTER
WHEAT

BURNING DEAD GRASS
AND HEDGE TRIMMING

WINTER



SPRING



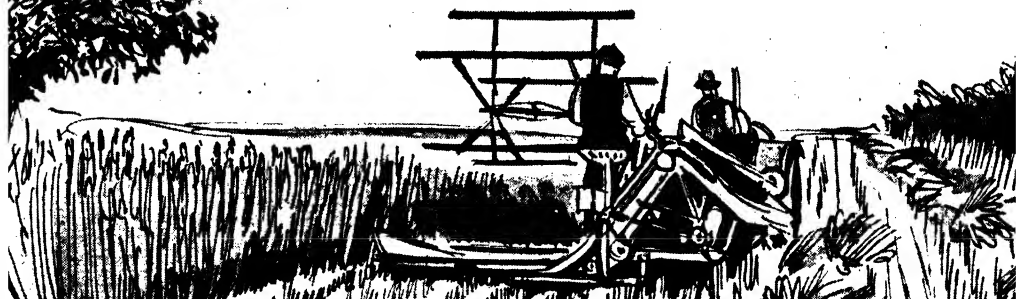
ROLLING

HARROWING

SUMMER



STACKING HAY





FEEDING THE LATEST ADDITION TO THE PIG POPULATION. *Considerable care must be given to the meals of a sow with a new family. Milk and whey, milling offals and kitchen scraps mixed with chalk and other mixed matter makes the best swill.*

a horse plough, and a wooden roll, and a harrow? And look at the crops they used to grow", says our man. "And now look at the amount of expensive machinery you are supposed to need. And are the crops any better?"

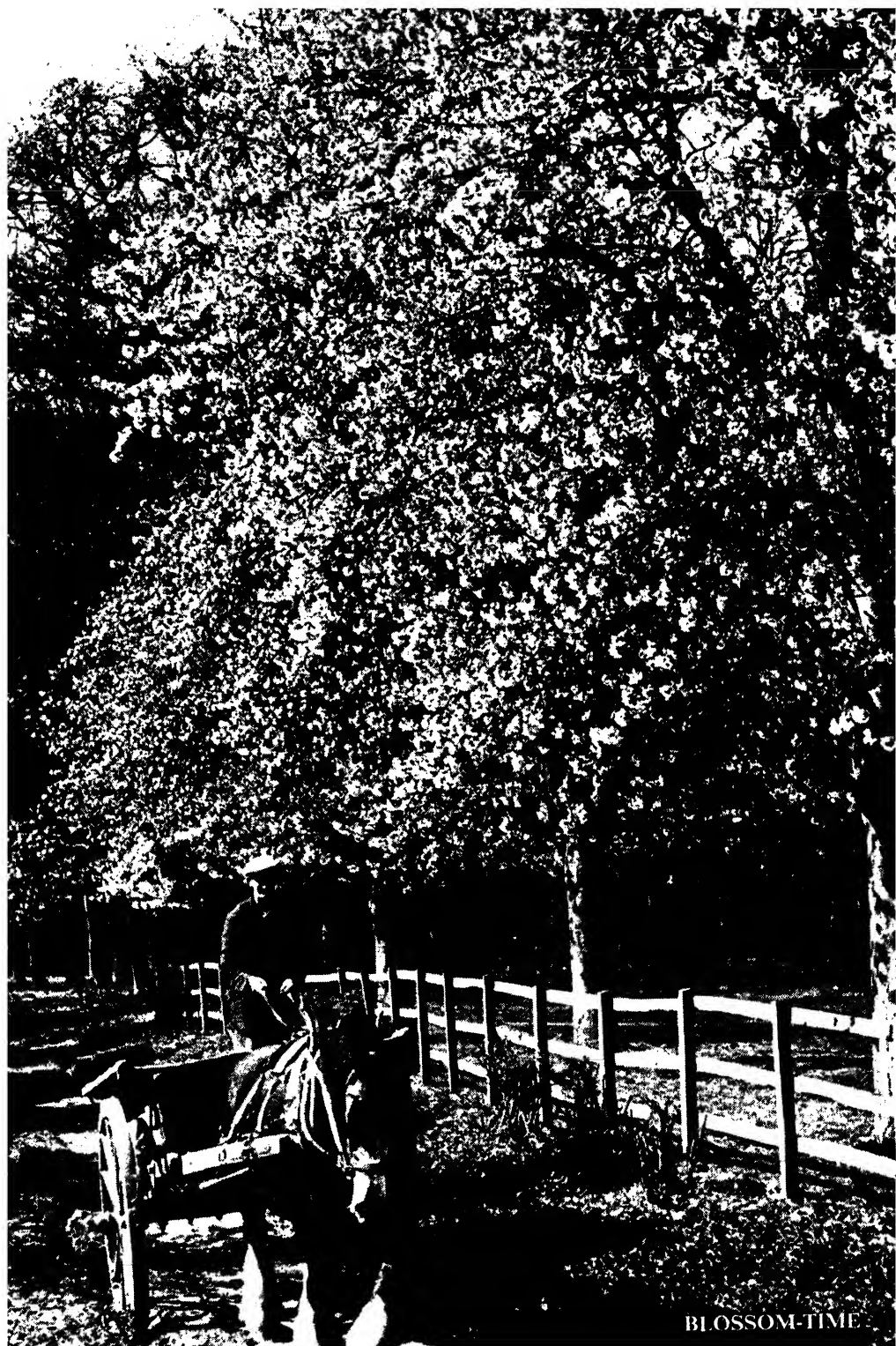
He forgets, perhaps, the cheap (too cheap) human machinery of those days of the wooden roll, and the abundance of it.

We lay harrows on the wooden roll to give it more weight, and a horse draws it out to the field. She seems to like old-fashioned things too, and steps briskly. Certainly our man does. The rest of us go hoeing the young kale. We are out of sight of the roll, it is hidden by a rise of the ground. We listen: we can hear nothing: it must have broken down. Despairing for the grass seeds one walks across to see. But there is the roll going to and fro over the young barley. Being of wood it does not make a sound. One is so used to the clanking of the iron roll, that this silence is odd.

The small circumference of the wooden roll looks absurdly inadequate yet the little cobbles of earth are being flattened down. One feels that one is looking at an eighteenth-century picture of farming; there is a sense of unreality, enhanced by the silence of the operation. It is delightful; I dare not say efficient.

The Horse-hoe at Work

Now the horse-hoe, the "scoop-hoe" as it is called locally, is put to work between the rows of roots and kale. It will not stop, save for short intervals, till harvest. One leads the horse, another holds the handles of the hoe and keeps it between the rows. This is pleasant work or not, dependent on your mate. If he or she leads the horse dead straight, then, though very few words pass between you (you are just too far apart for conversation), a sense of harmony broods over your team. If on the other hand, he or she is careless and allows the horse to draw first to one side then to



the other, the silence between you is full of unexpressed (or at intervals very forcibly expressed) reproach, as you try to keep the hoe from cutting up the rows. It is now that you vow you will have the counters of the drill repaired, renewed, tightened. For the rows are not exactly equal in width. A looseness of the counters has resulted in one wide row, which is made up for by another that is uncomfortably narrow. So you have an easy time going up the wide row, but you pay for it when you come to the next one; you grip the hoe for all you are worth, try to focus an eye on each side, which is difficult; and begin to have doubts as to the way the horse is being led.

There are eighty of these rows of mangolds between which the single blade of the hoe cuts, ruffling up the

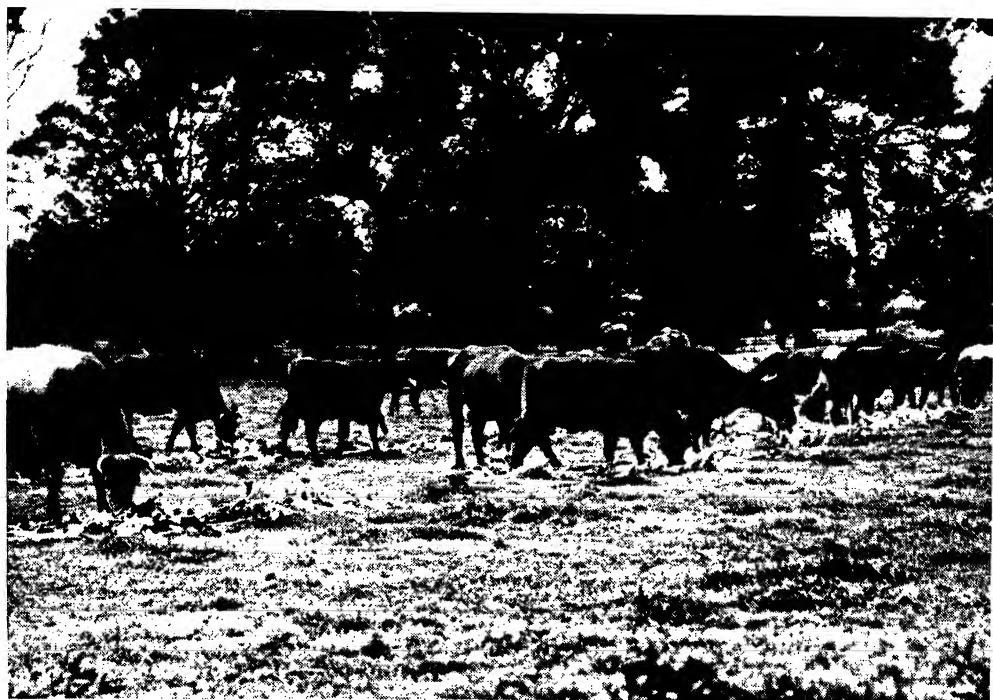
earth. If you count your paces from end to end you can reckon the distance you have walked in a day. These eighty rows only occupy two acres. Horse-hoeing them in a day, we walk eleven miles. This gives an idea of how far a farmer would travel in a year.

Summer Approaches

The farm work intensifies as spring turns to summer. Wherever there is any bare soil on the farm—between rows of crops, or on a fallow, it must be hoed or ploughed, again and again. In addition the plants of roots and kale must be row-hoed and singled by hand. This severely taxes the available labour. It is a long task, the side-hoeing, the spacing out, and finally the singling of the root and kale plants. By the time it is completed, yes, even before, the crop needs

GRASS DRYING IN PROGRESS. *These grass drying plants enable the grass land to be cut twice a year, thus supplying many tons of dried grass which not only retains all the essential benefits of natural pasture but also its original green colouring.*





SUPPLEMENTING THE EARLY GRASS CROP. *Mangolds, kale and sugar-beet tops are fed to the cows when the grass has lost its succulence. The production of milk all the year round takes a considerable amount of careful planning and hard work.*

to be gone over from the beginning again, both with horse- and hand-hoe. But there are compensations for the long hours one must work now for the weather is warm and sunny; it is pleasant to have one's dinner up on the field, leaning against that old wooden roll, brought here for rolling the ground after drilling the turnips. One gets to know this field, and the view from it, intimately; it becomes one's summer home. The may has faded from the high hedge; the beans have bloomed, scenting the air; already it seems a long time ago that we were spreading dung to the song of nightingales. Now the cuckoo's voice is breaking. Time, the season, sets us a race. Leaning back for half an hour's rest at dinner or tea, one is aware of how time is neck and neck with us. The grass beside the hedge tells us that; for hay-making is almost due, which

means a pause in the attack on the weeds, when they will regain lost ground. One juggles in imagination with the small labour supply, to see if by any means two things, hoeing and hay-making, could go on together, and decides it is impossible. People from the town, office-workers, pass occasionally cycling or walking, taking the evening air. One is inclined to view those easy bodies as so much human energy going to waste, with the eighty rows here to hoe, and another eighty of kale!

One can view, anyhow, with some satisfaction, what has so far been achieved; the corn and the grass seeds sown, with all the preliminary and attendant harrowings and rollings, the kale and roots well established and fairly clean. At least we have so far kept abreast of things. And of course, besides this work of the fields there have been

the inevitable accidents that occur in the keeping of cattle and horses. The day, for instance, when we were drilling the turnips, and the colts kept breaking out. Just when we had at last finished and the rain was coming down, they broke out again. It was eight o'clock in the evening; and we had to return and chase them over fallows made sticky by the rain in which we had just been rejoicing for the sake of the turnips.

Cows, too, are restless animals in summer. When the flies torment them, they will run through anything, or if the feed is getting short owing to dry weather, especially if there are weak places in the hedge. In the middle of a busy day, often that message "The cows are out again", has seemed to doom the work in hand. One has made fervent resolutions about double strands of

barbed wire all round every meadow. Chasing the heifers through that wild fairyland of "rough grazings", and through a neighbour's nut wood ringing with the voices of nightingales, tracking them by the pointed hoof-marks among primroses and violets, one's mind a medley of vernal blessedness and bovine malediction. The long, monotonous days of hoeing, however, quickly smooth the memory of these vicissitudes.

The Hay Harvest

Then comes the hay harvest. The mowing grass is tall and flowering. One looks at it waving in the wind and says, "Too late". Always one says to oneself "Too late". It would have been richer in feeding value if it had been cut a fortnight, three weeks ago. The grass leaf is the nourishing part, not the

CUTTING THE HAY. *At the busiest time of the year the farmer must put everything aside temporarily to bring in his hay while it is still rich in feeding value. This is a pretty heavy job and requires all hands to the fields from dawn to dusk.*



tem. But there never seems quite time to fit in all the other work first. One day, the farmer dreams, he will cut his grass at the ideal moment. The clover is in bloom also, and that is the right time to cut it for hay. By clover is meant the clover ley, which was sown among the spring corn over a year ago. Of the indescript-looking heap of tools in the farmer's cart-shed, each one has its hour. It is the turn of the grass-mower. Probably speaking, this machine should now be oiled and in a state of preparedness, ready for instant use. Is it? Or have those "wet days" which in imagination have been earmarked for such good work, been spent in gossiping with a neighbour, or loitering in the market town? How often we put our farming right over a glass of ale, when we might have been putting our precepts into practice at home.

Cutting the Hay

While the hay is being cut, rather talky and parched, one's mind is running on the theme of lucerne, the beneficent, blue-flowered lucerne. Its roots grow deep and it is impervious to drought. It is a great restorer of the soil also. All the while one is wondering where to put the cows next for a bite of grass, the word "lucerne" is running through one's head. Next year we will certainly grow a piece, and all our summer feeding troubles will be at an end. Always next year we are going to profit by our errors of this year. But here we come up against one of the mysteries of the soil. In order to be sure of your lucerne taking, you have to "inoculate" the soil. If you take, say, a bushel of earth from a field in which lucerne is growing and scatter it about over the land on which you are going to sow your seed, your lucerne will take, but if you do not, it very likely won't. The chemistry of the soil is a science, but also a

mystery. Why, for instance, is bracken an unfailing sign of potash deficiency in soil, while the bracken plant itself is very rich in potash? Surely, one would think, bracken, which needs so much potash for itself, would be least likely to flourish in a soil deficient in potash. Quite minute traces of other substances—boron, for instance—make all the difference between health and disease in plants and animals.

There are two ways with hay, depending on the part of the country in which you farm—to dry it, or to prevent it becoming too dry. In the north and west they are always raking it, turning it, scattering it out with forks till it lies in a thin mesh all over the ground, then raking it again, turning it, scattering it. In the eastern counties we cock it in heaps out of the sun's rays as quickly as possible. One day of such treatment as they give their hay in the north-west would spoil ours here. So everyone must come and make hay-cocks. Even the youngest helps, dragging a rake between the heaps; there are always wisps to rake up. By luck the weather is dull and sunless, which is ideal for making good hay, slow drying being desirable.

Making Haycocks

The nature of hay is loose and scattery; so the gathering of it upon a fork is an art. To have it all packed neatly into cocks takes a great deal of raking and scraping; for every solid forkful you lift, there remains half as much scattered on the ground, which takes twice as long to gather. In making hay-cocks that shall be weatherproof, you must turn your fork right over, inverting the hay upon the heap like an umbrella. How much of your original forkful remains upon your fork after this turn, depends on your skill with the tool.

A fair breeze blows up for the carting of it. A town friend arrives after tea to help, and strips off his coat, full of

CARTING HAY. *The hay is now ready to be carted and stacked, another day of bright sunshine and it will be too dry. Dull weather is ideal for making good hay.*

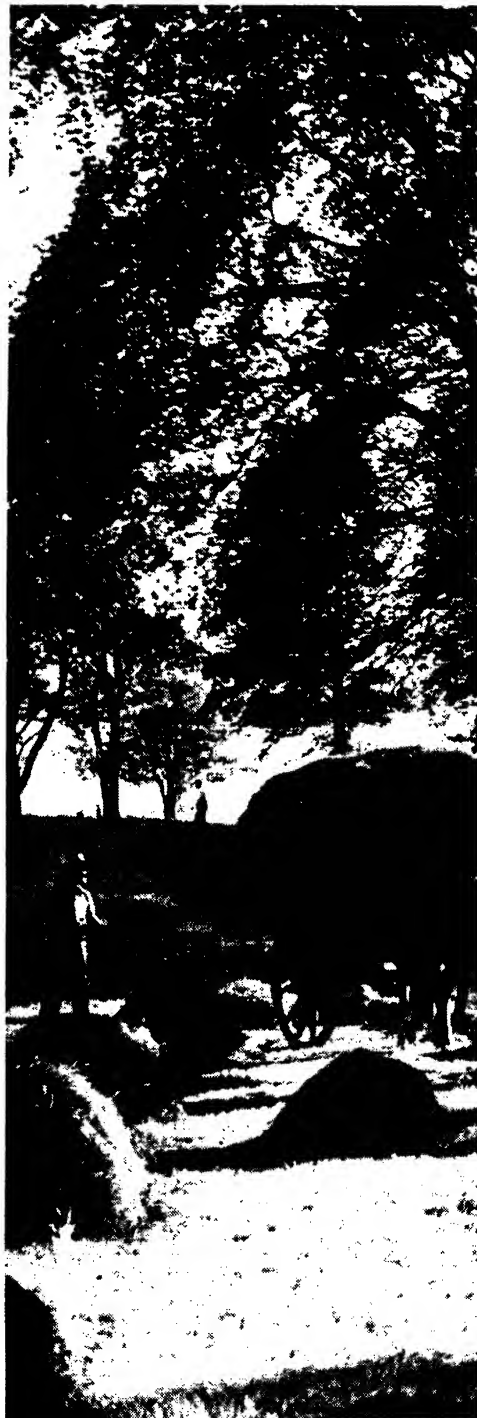
energy. Hay flies everywhere; on to the horse, on to the wagon and right over the wagon; we catch what we can of the exuberant forkfuls as the wind whirls them away. No doubt we look slow to him, almost lazy in our deliberate movements, but this is necessary.

The field is then horse-raked, and behind the wagon which gathers the rakings, the ground is raked again by hand.

The sight of the first stack, green and odorous, among the remains of last year's straw, seems to rejuvenate the homestead into an active freshness.

Ripening Corn

The corn is now in full ear, and the little crumb-like blossoms hang on the wheat. Showers are welcome, now that the hay is carted, to ensure that the corn shall swell and ripen, not parch. There may have been a pause between the hay and the corn in the days when imported cattle food was cheap and the growing of roots went out of favour. There is no pause to-day; the horse-hoe is needed in the mangolds again, and even, for the last time, in the kale. Beside the mangolds a crop of maize is growing to provide for the cows during September and October, when the grass is failing to keep up the milk supply. To view twenty cows with their heads down in a pasture, as you pass by road or rail, gives an illusion of ease in the production of milk, and the price of the small bottleful on the doorstep may seem excessive in view of such a peaceful, natural and largely unattended process as that observable from the highway. Actually, nothing gives the farmer so much hard thought, hard work,







BUILDING A HAYSTACK. *As the hay is brought in from the fields it is tossed from the cart on to the elevator, this is fitted with forks on chains which carry it up to the top of the stack. Here two men distribute it evenly with pitchforks keeping the*



weight as balanced as possible and seeing that the sides do not overhang. It is no simple job building a stack for it takes considerable skill to maintain the correct shape, and if this is not done efficiently the rain will get in and ruin the entire crop.



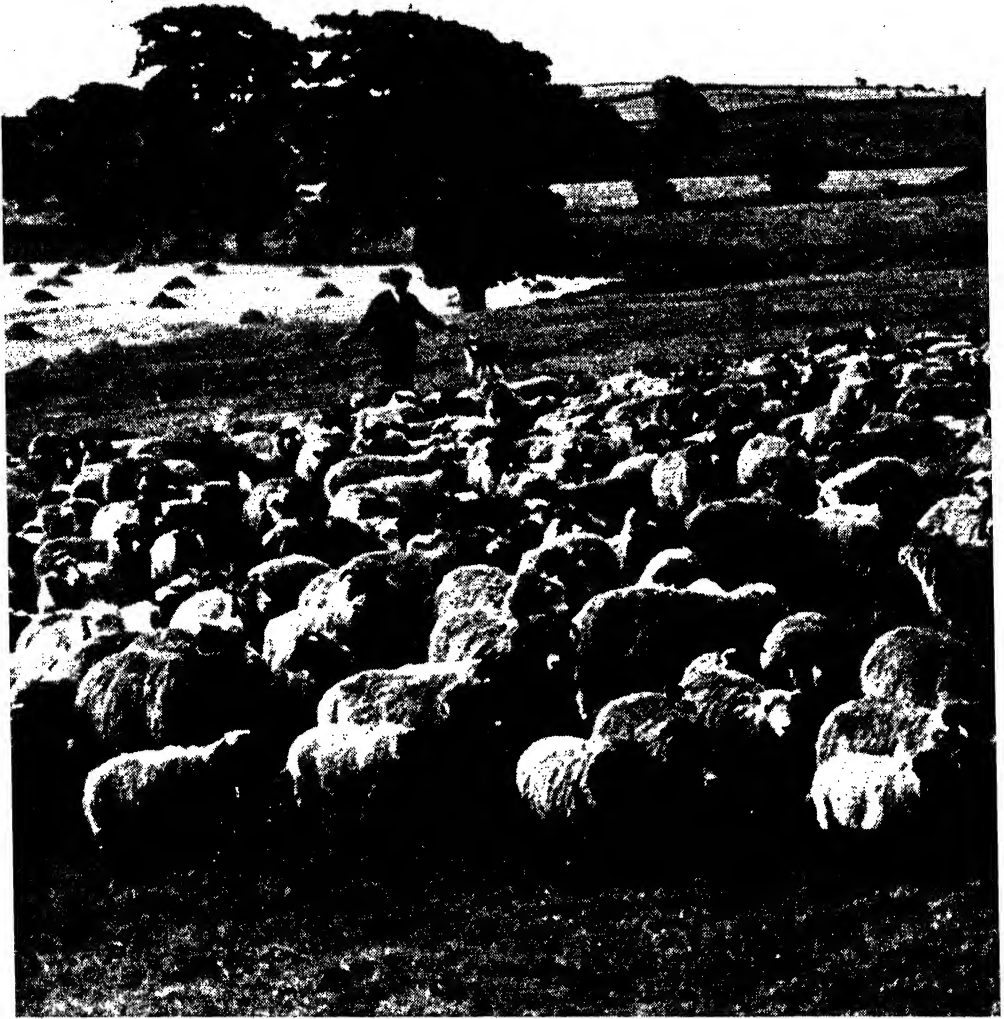
LAYING AND PLASHING. *This is an all-round-the-year task in the country. New hedges must be made and the old ones need to be kept in good order to prevent stock straying: clean ditches are needed to maintain adequate drainage of the field.*

and is so baffling in results, as to keep his cows milking well. Particularly is this the case when home farm produce must be relied upon to feed our people. It is agreed that cows are healthier on their home-produced ration, largely on account of its freshness and variety. Before, the tendency was to compile a scientifically "correct" ration for milk and the maintenance, which was mostly of bought food, and go on stuffing them with this monotonous concentrated diet, and drawing the milk in return. In a word, it was not farming, but machine-minding—the cow being the machine. Well, cows *are* machines; we have made them what they are—all-the-year-round milk-producers; but they are living beings first, and if we ignore the unknown living quality in them, that spirit of nature which "bloweth where it

listeth", we do so at our peril. Now we have to grow the food for our cows, and much skill, luck and planning it takes to provide for them throughout the year. How many and various are the crops on one farm on which the cows are wholly or partially fed. Maize, waving its green plumes, man-tall, which lends an almost foreign lushness and grace to the field; then kale, drenching stuff to cut and load. There are sugar-beet tops and the pulp of the sugar-beet after extraction of the sugar. Swedes and turnips are followed by mangolds and vetches in the spring, and in the time of midsummer drought, lucerne. Then, for the concentrated part of their food, that field of peas, that field of oats and that field of beans will all be devoured by cows before next harvest. This besides hay, silage, and the grazing of leys of temporary grasses. All these

MECHANICAL MILKING. *A revolutionary time-saving innovation in farming is the mechanical milking device. Usually worked by electricity, the apparatus works through suction and draws off the milk efficiently from several cows at once.*



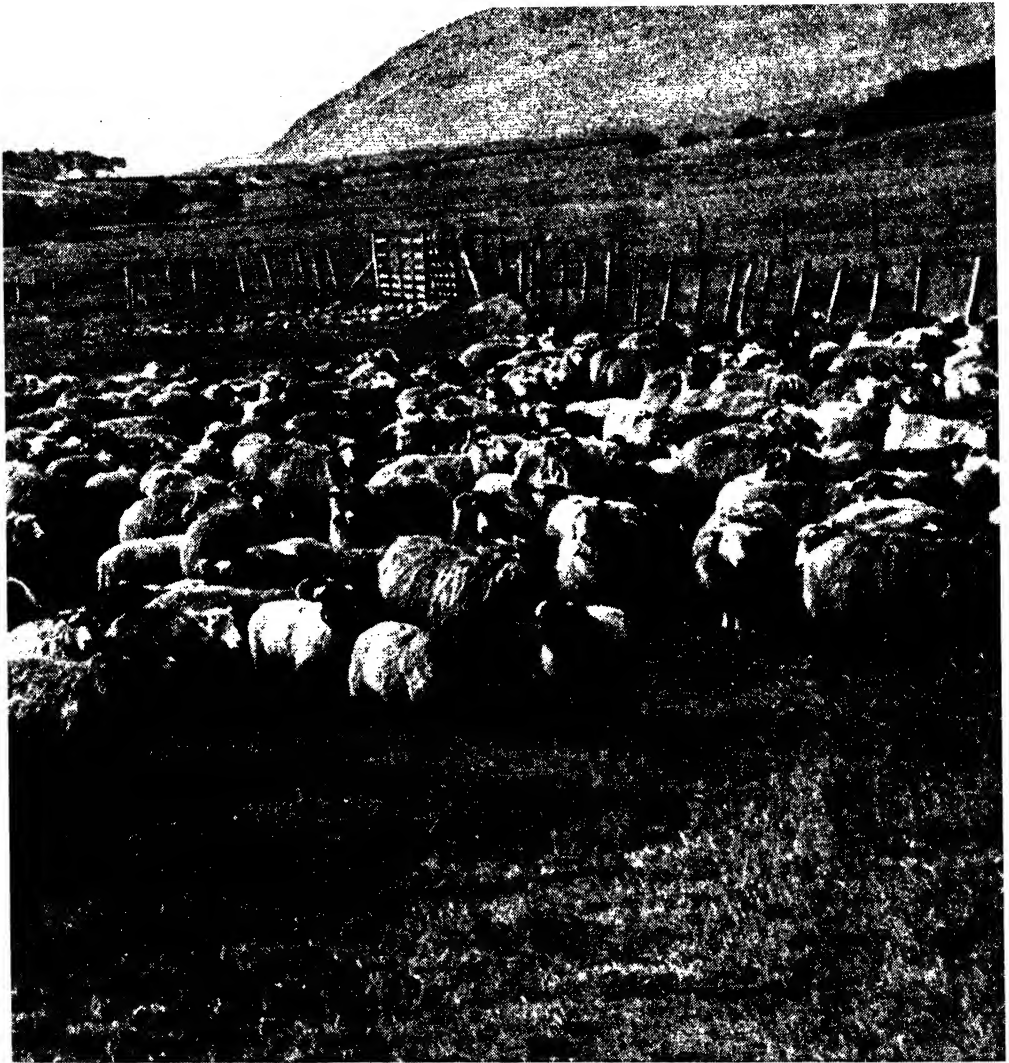


ROUNDING UP SHEEP FOR DIPPING. *This photograph was taken in the Fell country of the Lake district. Although sheep can get a living off stubble which would*

must be ploughed for, sown, hoed, mowed and carted. So the sight of cows contentedly grazing in an old pasture is the least part of the process of milk production. Years ago, the arable farmer produced corn and beef; he bought his steers in the autumn; they trod straw into manure in his yards during the winter and he sold them in the spring, when his land-work recommenced. A comparatively simple process, absorbing

labour when it was not needed on the land. Now he produces corn and milk the year round, as well as sugar-beet, all of which require much labour, and at a time when labour is scarcer than ever it was to his predecessors. That bottle of milk, that little jug of it we take for granted on the tea-table, is in reality a great achievement.

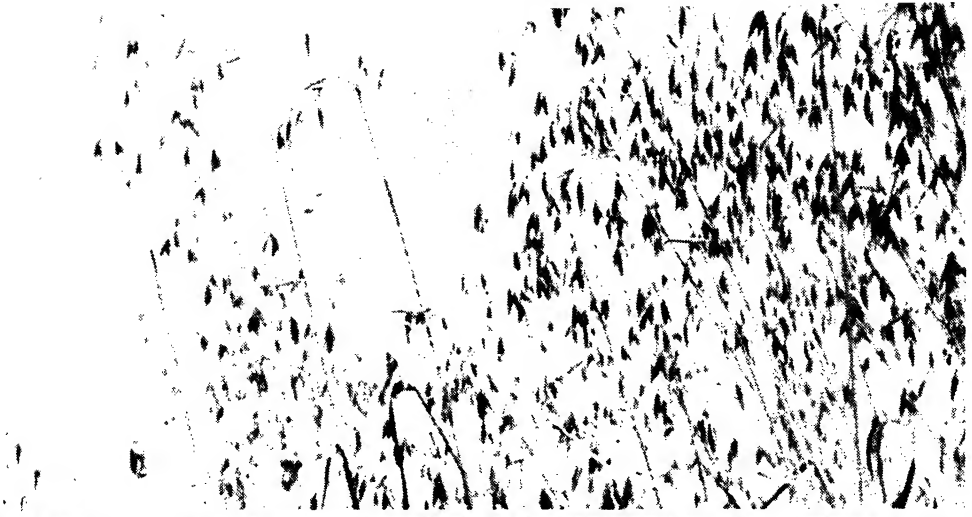
Another thought may occur to you as you stand observing the contents of



be useless to cattle, they are prone to many diseases, and towards the end of July are dipped in a solution of arsenic and sulphur to protect them against the maggot-fly.

a farmer's cart shed, while the farmer is disencumbering a certain rather rusty steel skeleton of a year's accumulation of bags, bird-droppings and other things laid on it. It is the eve of the corn harvest, and this object, when it is dragged into the open, is seen to be nothing less than that wonderful invention, the self-binder. It is old, and looks as though it could not ever work again. But the farmer, man of earth whose

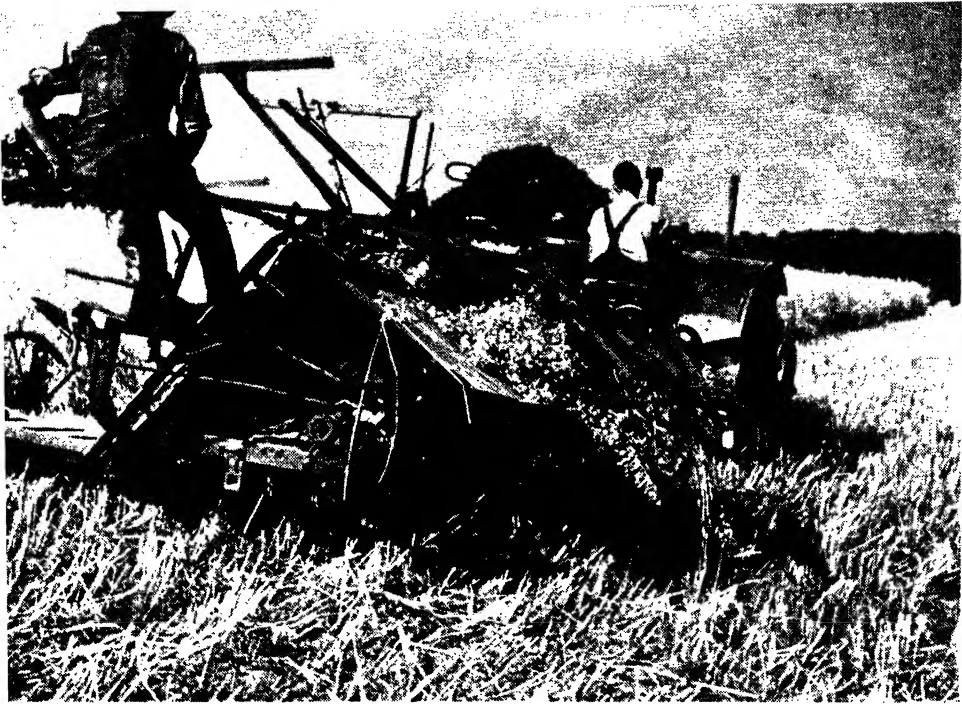
ancestors had nothing but horse-plough, harrow and roll, tinkers with it, takes a handle and turns, whereupon much of its internal mechanism is seen to revolve. He pokes chaff of last harvest out of little holes, and inserts his oil-can nozzle, sharpens knives, spends awhile under the machine threading string. Meanwhile, another man is in the oat field wielding a scythe; he is mowing a path for the binder round the edge of the corn



THE STAFF OF LIFE. *In Britain the only cereals widely grown are wheat, barley and oats. We can see oats in the top picture, barley in the lower, while on the right is wheat in full ear. Oats are grown chiefly in Scotland and Ireland because*



of the damp nature of the climate, whilst barley and wheat grow excellently in England and Wales. The ripe heads of these different types of corn are easily distinguishable. Their obvious characteristics can be seen in the accompanying photographs.



REAPER AND BINDER. *One of the ways in which the engineer aids the farmer is in the provision of mechanical harvesting equipment which performs several tasks at once. Here the corn is cut, automatically bound and delivered.*

The necessity of making a way for the machine results in this vestige of hand-labour, the mower and the man following, and the old-fashioned sheaves bound with their own straw.

When at last the machine is ready, the tractor is hitched on to its pole and the farmer drives it out to the field. It starts into the corn, and for the first few rounds there are break-downs. The knotters are rusty and the sheaves are thrown out untied. Then a chain comes off and is picked up in fragments and patiently pieced together. One of the canvases has a tiny hole which lets through some corn which jams in the rollers. With a spanner and pliers the farmer makes a nail do duty for a missing split pin, manages to tie up the canvas with string. He explains that it was going all right when he last used it. But there must have been weak spots he had forgotten.

This is not due to farmers' neglect, but to the poverty-stricken state of farming for generations, which has precluded the buying of new tackle. The only times the farmer has been able to afford new implements have been in wars, when they were difficult to get. The same applies to his buildings. No other business could carry on for a month under such handicaps. Yet the farmer goes on patiently patching up ancient and intricate machines. He is a master of improvisation with nails and wire. The only new and efficient mechanism he has is the tractor. With this he does wonders, working it from light to dark when the weather is favourable. Not only does he drive it, but he begins thoroughly to understand the anatomy of it.

Towards evening a number of people collect in the harvest field where the

tractor is drawing the binder, a large proportion of them children out of school. The older boys are even more interested in the tractor than in the prospect of rabbits. Ask those boys what they want to do when they leave school, and the answer is invariably "Drive a tractor". If you mention horses, they just shake their heads and grin. Make no mistake, tractor-power and its possibilities have seized on the imagination of our country youth.

And with what ease this machine pulls the binder, in second gear, at half throttle. Whereas it could tire out three horses in half a day. Pulling the binder is cruel work for horses. This, and certain other tools on the heavy-land farm have been known as "horse-killers". Those who most regret the coming of the tractor, and they are generally the animal-

lovers, would do well to ponder this.

The order of the cutting of the corn is oats first, then wheat, then barley; unless any winter barley has been sown, in which case that comes first of all. There is another crop, though, which defies the binder, and usually even the grass-mowing machine that cuts it; that is field peas. These may be pulled up with a rake, which tends to strip off the pods, or mown by hand with a scythe. As they are mown they are rolled into heaps, or "locks" as they are called, each about a comfortable forkful. This is laborious work, but in many cases it is necessary, for it is only by carefully inserting the point of the scythe between the stems and the ground that the peas can all be cut; they lie so flat that the grass-mower would run over half of them without cutting at all.

STOOKING THE CORN. *After the mechanical reaper has passed, the sheaves are collected and stooked by the sun-bronzed workers; this is the time of the year when the farmer prays that the rain will keep off until the crop is safely gathered in.*



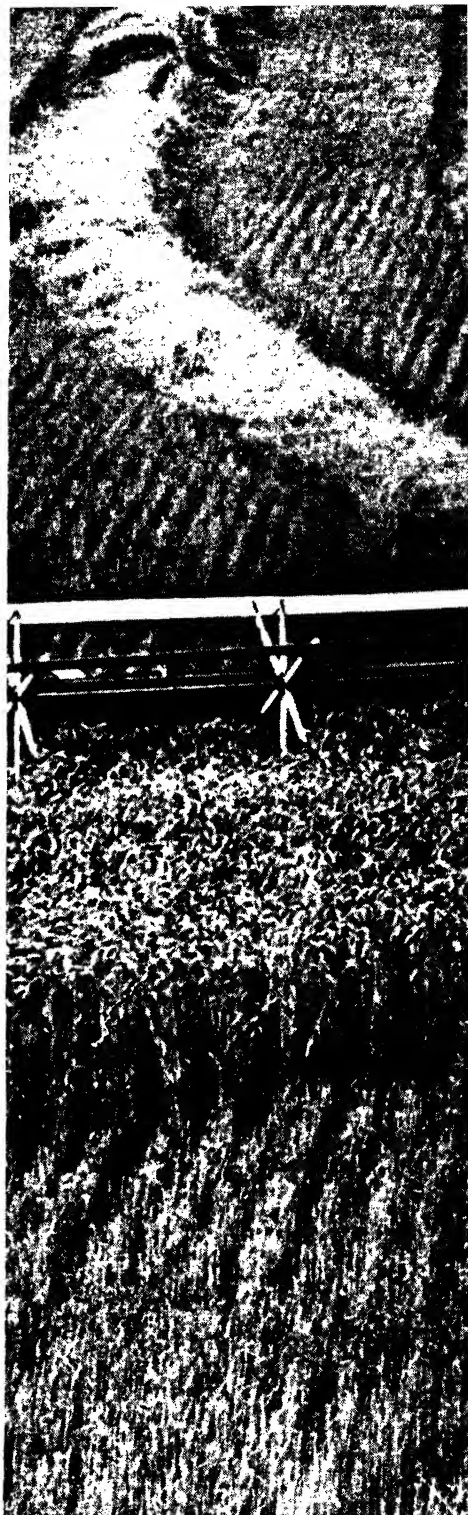
THE COMBINE HARVESTER. *With this machine the corn is cut and threshed from the straw as it stands in the field.*

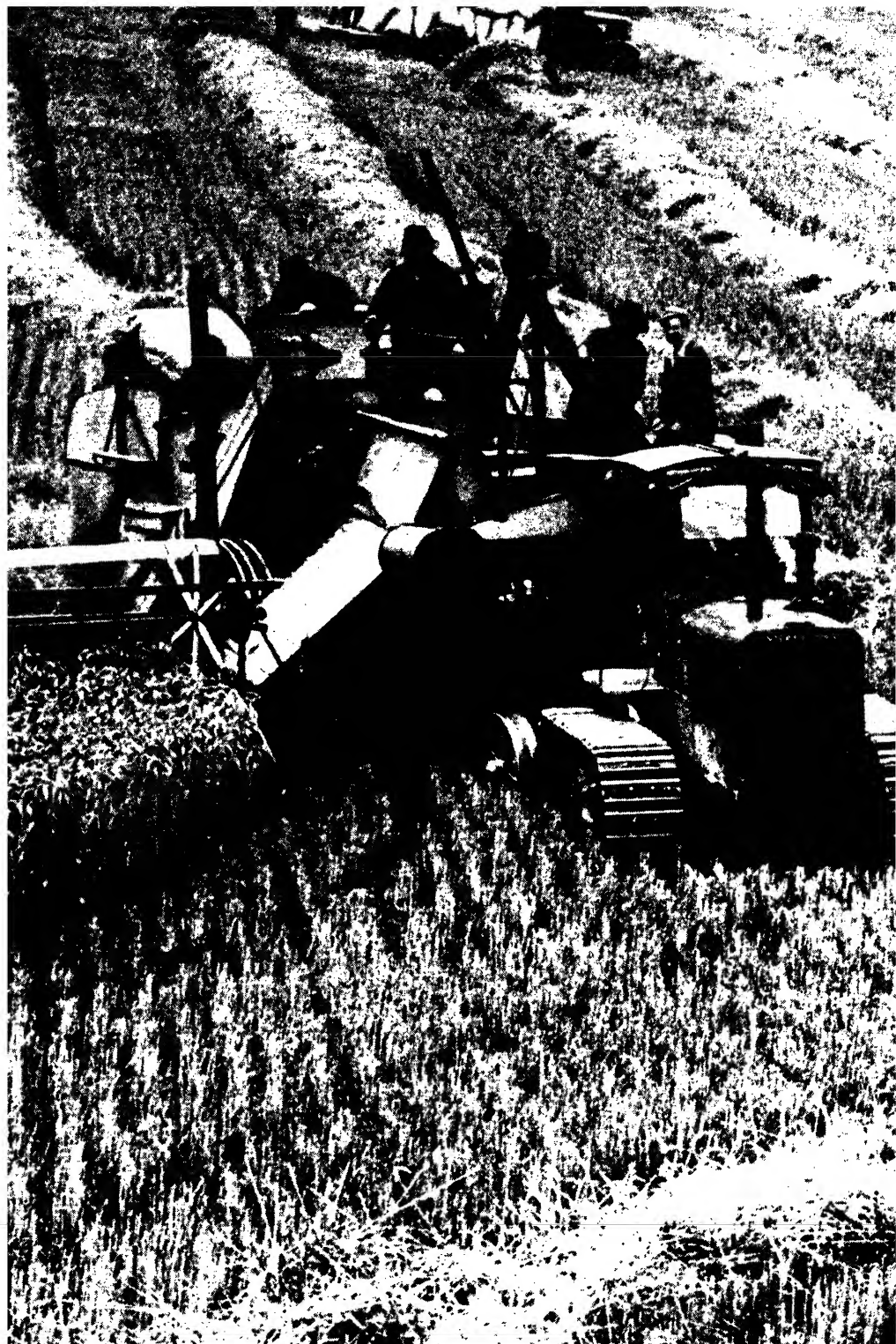
From spring onwards there is green food to be mown daily for cows and calves and bull. During the later summer it is the practice of good farmers to cut the grass and brambles all round the edges of their fields so that when it is time to plough again, the ploughs can cut close to the ditch. The grass verge, with its briars and brambles, is always trying to steal a yard of the field. Memories of summer include those of early mornings when the 7 o'clock train (it was 5 a.m. by the sun) has passed us in the field, shirts already soaked with sweat, scything a load of green before starting the real work of the day.

How do we tell the ripeness of the crops? The oats peep out of their husks, which open with the heat of the day. The wheat we rub out in the hand and test the grains - if they have lost their milkiness their time draws near. Barley hangs its head and if its beard begins to fall off, it is already over-ripe.

All Hands to Carting

Now out come the tumbrils and wagons, and all hands are wanted for the carting. This needs organizing so that one cart is at the stack, one in the field, and one travelling between. A sheaf of corn is handled many times from its cutting to its threshing, and in each handling there is employed a separate skill. The passing of the sheaf through successive stages, the building and un-building, are by now so traditional that they have become almost sacrosanct, a sort of ritual of human skill (not forgetting that of the thatcher) for its own sake. Now the combine harvester comes on the scene and threatens to short-circuit the whole picturesque process, so that there will be no sheaves, no









CUTTING CORN IN DEVONSHIRE

stooks, no stacks, but corn threshed from straw as it stands, and straw picked up and baled by another machine. Does this shock us? If so, we must try to picture the effect of the first self-binder, which by-passed another ritual of hand labour; how it was resented, how it has now become embedded in the tradition of farming. Nevertheless, we should miss the sight of neat, new, well-thatched stacks in September, even though the skill bestowed on them is for so little a while. They are the visible wealth of the year; often thatched and clipped and shaved to an ark like symmetry. Then comes threshing-day, and by evening the stack-yard is in a state of dusty confusion. Only the great straw-stack rises orderly out of it, built very likely by the same man who built the stacks of corn. The building of the

straw stack is just as important, though often less well done, since threshing needs so much labour (eight or nine men), and if there is one short, it usually means that only two instead of three are on the straw stack. Yet a stack of sweet, dry straw is a great asset; if the rain percolates into it, it causes black rotten patches right through and much must be thrown off before one good cart-load can be got. It is a mistake to leave a ladder up against a straw-stack if there are boys about, for nothing so delights them as to romp about on the roof, stamping it into hollows ready to catch the rain.

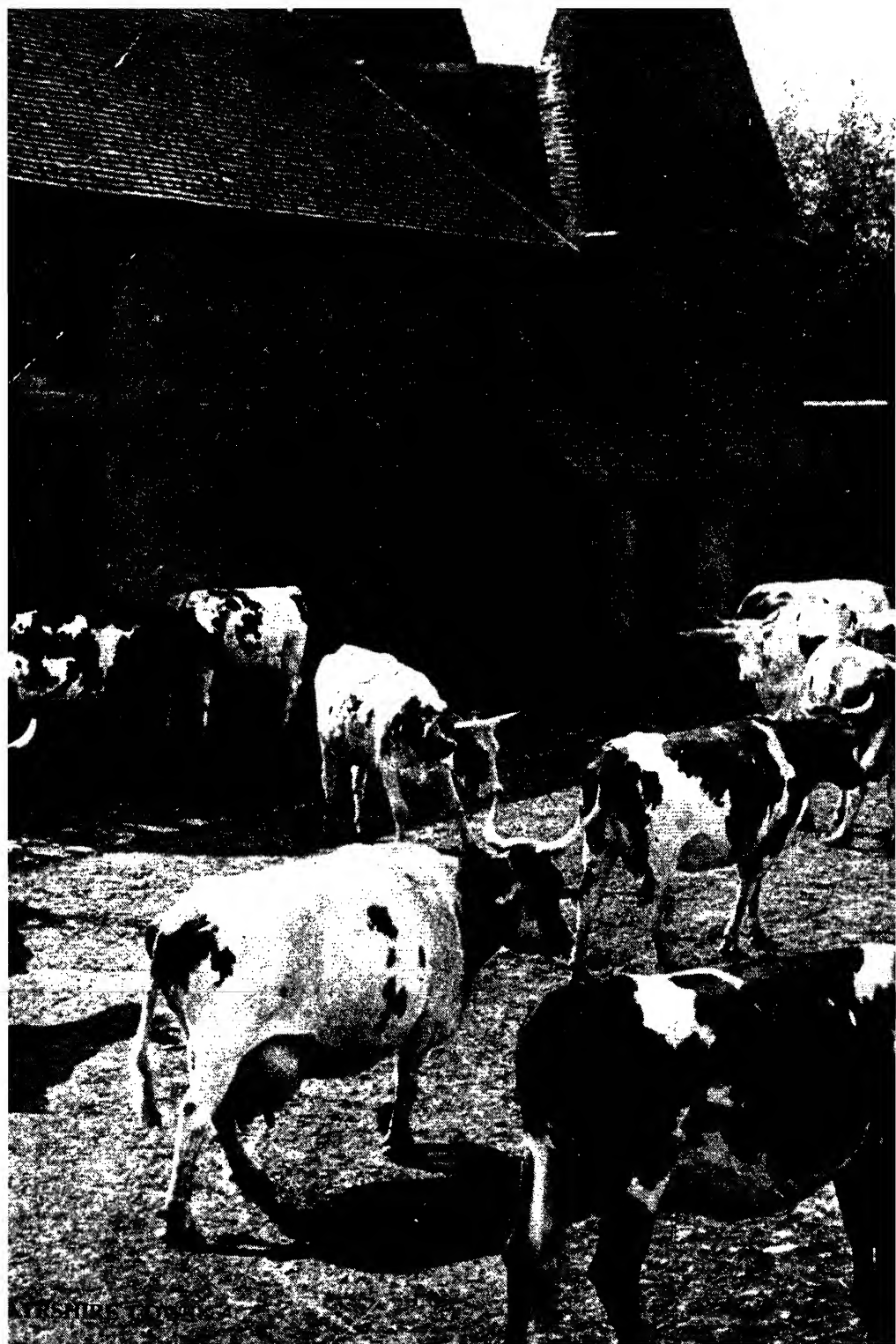
No farmer likes the threshing-machine, though he is often impatiently awaiting it. The difficulty of finding sufficient labour for it grows yearly more acute. It usually comes just when he is ready

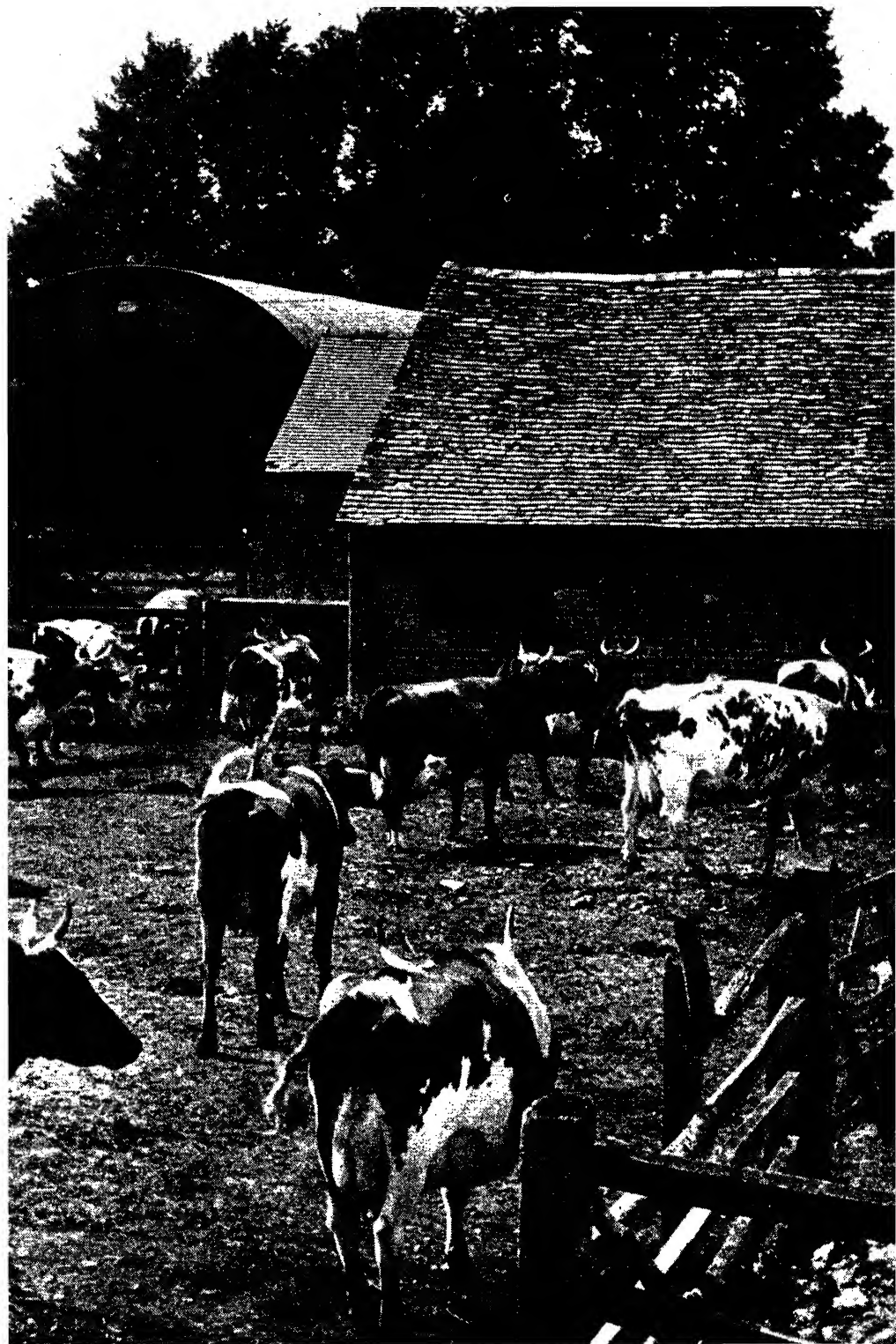
THE WHOLE STORY OF HARVESTING. *Three stages in the process of harvesting can be seen in this picture, the standing corn in the middle distance, corn cut and drying in the next field, and, in the foreground the corn is standing in stooks.*





HATCHING A STACK. *There is an art in stack-making if the hay is to keep sweet. Hatching, shown in the above photograph, ensures that heavy rains do not rot the hay: ventilation passages are left to prevent fire through internal combustion.*







A CROP OF SWEDES. *Invaluable for "cleaning" the land and renewing its quality is this root crop generally used in the Norfolk, or four-course, rotation of crops. The swede itself is of considerable value as winter fodder for cattle.*

to drill a field of wheat, or some other autumn work is urgent. There are innumerable details to be thought of, sacks, coal, water, weights and scales, storage room. When it departs he heaves a sigh of relief to see his geese, ducks and fowls in its place, foraging among the debris it leaves behind.

Maximum of Food

It is certain that whatever picturesque and familiar country sights may be sacrificed, the farmer will pursue his single aim of producing a maximum of food with a minimum of human effort. Efficiency of this kind is a law of nature, of which the honeycomb is a mathematical example, and the farmer would be going against nature were he not to decide for or against any machine by this standard of labour saving alone.

The carting of manure, for instance, is still heavy, muscular work, for the reason that so far a satisfactory machine to do the job has not been forthcoming, though many are in the experimental stage.

The carting of manure is work following close on harvest. Even during the carting of corn, the farmer's mind is ahead of the season, and is planning the next year's crops, and determining the order of the ploughing of the fields. You may even see strips of ploughed land among the rows of sheaves. The field which bears an aftermath of clover, perhaps, is now peppered over with black manure heaps, which in a day or two have been spread. Then comes the tractor-plough; it can be heard humming after sunset, even after the afterglow. The big square of green is now a

square of brown; in a day or two the drill and harrows are travelling over it. In another field the manure-spreaders are at work; but this time sowing a white dust of fertilizer, and the plough, too, has moved on there. Harvest was finished in September; by the end of October all the corn should be in: several of those brown fields are green again in November with the young wheat blades coming up in rows: the beans in wider rows are showing their broad leaves, and the winter oats are putting forth their strong upright spears.

The last act of the farming year is the carting of the swedes and mangolds to the stack-yard, which is still littered with the remains of threshing. There the

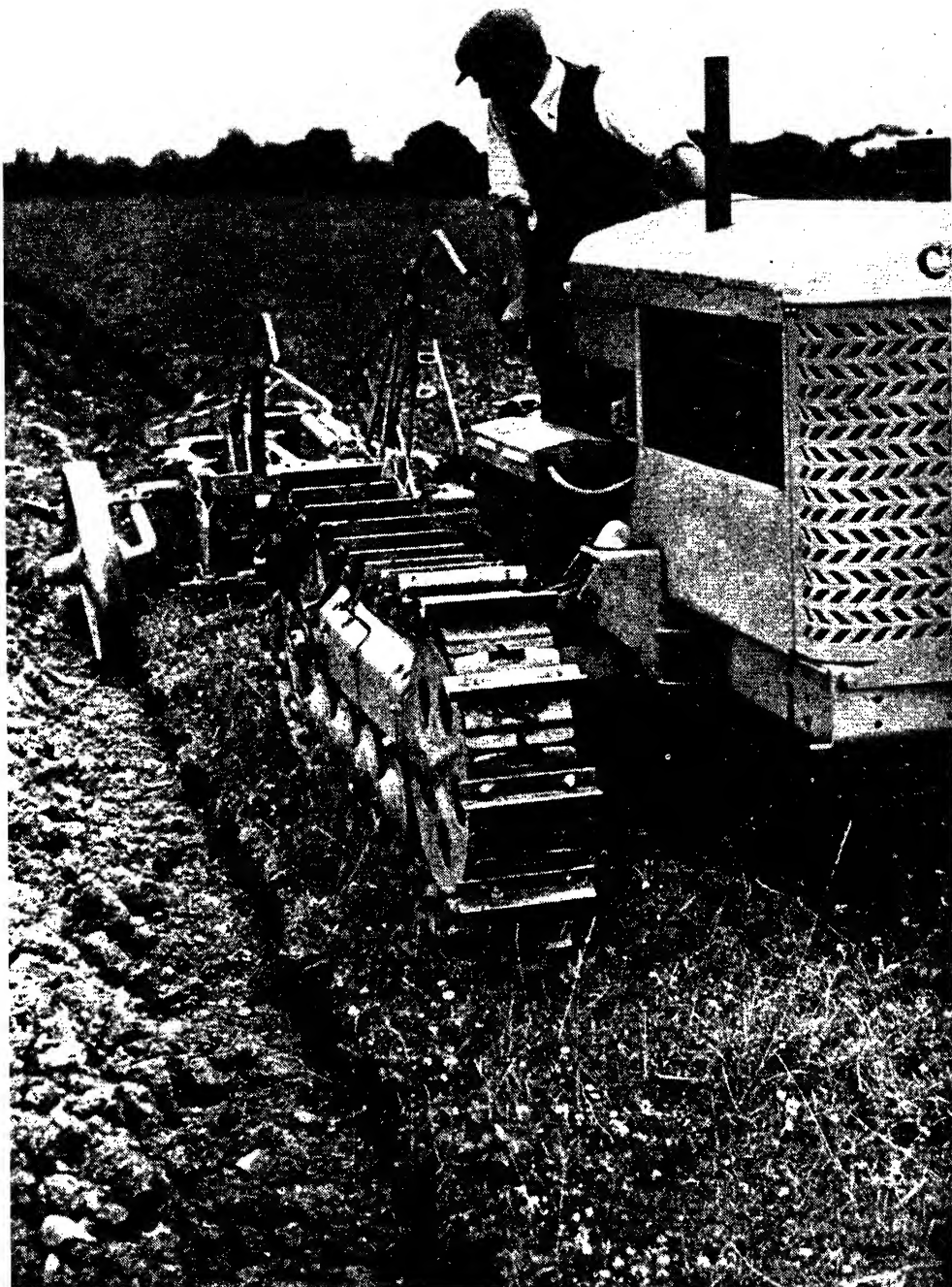
bright red-and-yellow loads are tipped and clamped and thatched with straw, and earthed up. But most likely the farm will have a fair acreage of sugar-beet as well, in which case November becomes a rush-season also, in an effort to get the fields cleared of roots before rain makes the ground soft, and the carting becomes heavy for the horses and injurious to the land.

From Cowshed to Stackyard

The farm, as it were, draws into itself now; the focus of its life is not so much on the fields, but on the cowshed and stack-yard. Cows will be calving about now, a state of things contrary to Nature, who likes her calves to be born in the

AUTUMN PLOUGHING. *The business of ploughing the fields after taking up a crop is of vital importance, for the decaying vegetation left behind after the potato harvest makes valuable manure when ploughed back into the ground again.*





THE TRACTOR-PLOUGH AT WORK. *Ploughing fallow land in autumn is a most important undertaking, for the coming frosts perform a necessary function in breaking up the newly exposed earth and thereby preparing it for the spring sowing.*

GATHERING IN THE SUGAR BEET. *Sugar beet provides one of the farmer's most profitable crops. The beet itself has a high sugar content, which when extracted by being sliced and immersed in warm water, is chemically treated and finally crystallized.*





FEEDING THE LIVE STOCK DURING WINTER. *Here we see the hens and cattle being fed during the winter months. Careful planning keeps up the production of eggs and milk during the long weeks when fresh food is not available.*

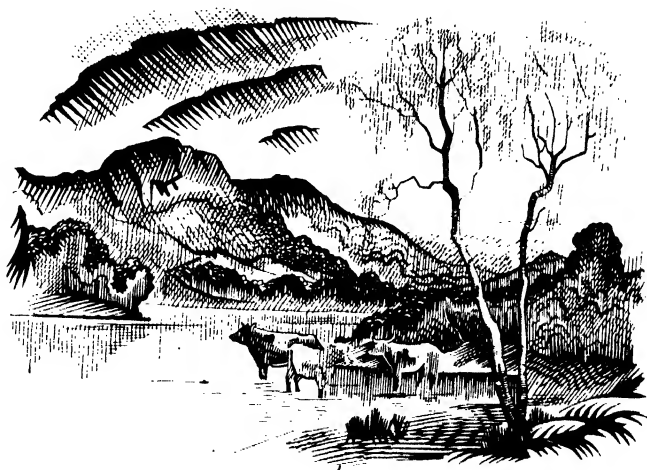


spring, when she can provide for them milk from fresh young grass. But owing to the demand for winter milk by our great cities, the farmer arranges, as far as possible, to have his cows calve in the autumn. He has warm yards and houses for them, and in place of the young grass, has kale, turnips, swedes, silage, sugar-beet pulp and tops, corn and hay. One person's time is taken up with carting, grinding and preparing these various foods.

In the old days of corn and beef, winter was the farmer's holiday. Nobody can dawdle so profitably as a farmer, though nobody at a busy season can "go to it" with more effect. In winter he could dawdle, "tiffle", "fudge about" ---there are many local words for it---in enjoyment of the sight of munching, fattening steers in his deeply-littered strawyards. He could repair fences, gate-posts, spend hours along his hedge-rows, gun in hand, making innumerable observations of wild life as he did so. He would "read" his hedgerows as another might read a book, tracing out an overnight story of nature red in tooth and claw by a few feathers, foot-prints, droppings, fur. He could detect

paths in the grass of the ditch-side made by habitual animal prowlers: he could tell by the way a few feathers had been "mouthed", or a rabbit bitten, whether cat or dog, fox or stoat, had been at work there.

Now *corn*, which is the key-note of his summer, is replaced by *milk*, which rules as emphatically his winter. The feeding and tending of cows for winter milk production is a process as complex and critical as his race with summer to the finishing-post of harvest. So he is less to-day the figure with the sporting-gun, and more the white-capped, white-robed, half monk-, half surgeon-like keeper of a concrete and steel cow-shed. And while he is one of the few producing milk and bread for an urban and industrialized many, this must of necessity be the case. If on the other hand, the many should disperse from out of their present vast agglomerations, and settle into the country, where, without turning it into a city, they could marry industry with agriculture, and provide much of their own food as well as manufactures, then we could look for a return not of the slow and cumbersome old methods, but of the old spaciousness of the farmer's day





SPRING BLOSSOM. *The rich colouring of the wood and the dark green leaves are a fine contrast to the snow-white splendour of a cherry tree in flower. Apart from its delicious fruit the wood of the cherry is valued by cabinet-makers*



THE PROCESSION OF TREES

ENGLAND is full of trees. Single trees, trees in small groups, trees in open woods are as much the making of the landscape as the hedgerows which themselves are largely made of small trees: of thorn, hornbeam, maple, hazel, elm and even oak and ash. The trees embower the churches, the homesteads and the villages; and frame a thousand homely views. No country is so rich in individual trees. It is difficult to find a place, even in London, where no tree is to be seen. Indeed, a variety of one tree, the plane, is said to have mysteriously come into being in London.

Some of our so-called forests are the most treeless districts within the island, as on Exmoor. Nor are there any large woods, as size is measured in other countries; for the history of our civilization is largely the struggle to destroy so dark, fearful and forbidding a thing, barren in itself and dangerous for its wild beasts and human bandits; and to carve out in its place farms and homesteads. Happily we began to preserve woods and trees just as the limit of right destruction was reached; and have in consequence nowhere suffered from the denudation which begins to threaten both North and South Africa and the

United States, where too many trees have been felled or burned or else destroyed by goats.

This prevalence of trees makes England into a succession of parks; and the English have before their eyes a sort of seasonal almanac. The country is continually becoming a new place. Not only are the majority of trees deciduous, that is, marked by falling leaves, but the leaves change colour in regular procession from the first purpling bud and delicate green of early spring to the brown, ruddy or purple colours of autumn. More than this, the delicate tracery of the bare boughs in winter and the hard bark undergo a subtle transformation scene. What is sometimes called wintergreen spreads over the trunks and long before the first leaves appear, flower buds, perpetually changing hue, break open, and these flowers are of a great variety of form and tint. Even a single type of tree may have two sorts of colour. For example, the male flowers of the hazel, usually known as lambs' tails, hang out numbers of golden tassels in February. They are conspicuous from a distance on every other hedgerow or in Kentish plantations; but you must look close to see the



SUMMER—BURNHAM BEECHES



AUTUMN SUNSHINE. *The lovely shades of gold and rust so typical of an English autumn are most noticeable among the woodland trees as seen here.*

other, the female flowers, which are crimson stars of diminutive size. Both may open as early as the first week in January. Then later comes what countrymen call the blackthorn winter, when the pure white flowers of the sloe open on the almost black shoots, still bearing no sign of leaf.

England has a few places called Forest which particularly concern lovers of trees. The New Forest, Epping Forest and the Forest of Dean stand out particularly; and all three of them still keep the old savour as well as the old form of management in their Verderers' Courts and "agisters" and the rest. The New Forest, partly open, partly woodland, has changed from time to time in appearance owing to national needs. Once it was specially cherished for its oaks, needed to build the wooden walls of our ships, many of which were built and launched at Buckler's Hard in the New Forest. Then the need for pit-props persuaded the Government to afforest a number of acres with conifers, in the Forest of Dean as well as the New Forest, though such planting drew protests from commoners who had acquired many rights within the forest area when the kings were dispossessed. Then came a day when ash was in urgent demand for the making of aeroplanes and ash groves were planted. However, the crowning beauty of both these forests, as in most English woods, lies in the mixture of trees; oak, beech, elm, ash, birch and holly. This medley distinguishes the New Forest abruptly from Savernake Forest, a little way to the north in Wiltshire, where beech and oak hold supremacy, and with their shade and the size of individual trees create a woodland almost







THE FROSTED HEDGEROW

free of undergrowth and singularly open. It is noticeable besides for the great green roads that penetrate to its centre, and contains a number of single oaks of immense size and antiquity, more than one of them over thirty feet in circumference. A very long straight double line of beeches, planted in 1771, makes one of the most famous avenues in Britain. However, the 4,000 acres of Savernake cannot compare either with the New Forest or the Forest of Dean in scale or variety. The former is much the biggest unenclosed forest in Britain, covering about 100 square miles; and when it was taken over by the Commission of Woods and Forests in 1851, it was decided to reafforest as much as 10,000 acres. There is more open land there than in the Forest of Dean, which covers about 19,000 acres. Part of its woodland consists of oak and beeches in clumps separated by patches of gorse and heather, and some of the glades are fringed with ferns. In the finest part of the old forest the trees are large and wide apart; but even thereabouts are areas thickly overgrown with holly and hawthorn.

The old form of forest government has been very carefully preserved at Epping where Londoners can still savour the wildness and antiquity of the once immense forest of Waltham. It is preserved in perpetuity as a recreation ground for London and may almost be described as a national park. The most curious feature of its trees (as also of the famous Burnham Beeches on the other side of London) is that an immense number of them have at one time or another been lopped or pollarded and this has caused many to grow into queer shapes and gargoyle-like forms. The hornbeams, which grow in greater number than anywhere else in England, have assumed yet quainter shapes than the beeches and oaks. The forest was

taken over by the Corporation of London in 1874. One other forest must be mentioned: Sherwood, the haunt, according to legend, of Robin Hood; this still keeps a part of its old woodland and encloses many very large oaks.

In general, the west of England is more fully treed than the east, though some of the forests so-called, such as Radnor and Clun, are singularly bare of trees; and few except some willows, mountain ashes and scrub oaks have managed to survive on the more exposed and higher uplands of Dartmoor and Exmoor. Yet even there, trees grow freely in any sheltered crevice or nook, as, for example, at Woody Bay. Somerset is particularly rich in woods and trees.

The Trees of Wychwood

A word is due to one wood in particular, Wychwood in Oxfordshire. It covers some three thousand acres and includes an avenue of lime and beech planted by John Evelyn. Here, too, among the oaks and limes and very numerous hawthorns is a fair sprinkling of hornbeam, and one particular service tree of unusual size.

Nearly all the native British trees are spread at random about the country. Very few are local. It is said that the wychelm has a preference for the north, and the slender birch is often associated with the wilder northern scenery. Yet the only tree that may be labelled native to a particular part of the island is the Scotch pine which fully deserves its name. The soil rather than the latitude has determined the prevalence of various species. Oaks have always shown a certain preference for clay or heavy land, as on the Weald of Kent, the beeches delight above other trees in chalk as at High Wycombe and over a great part of the Chiltern Hills. Alders, willows, sallows and, less exclusively, poplars flourish alongside the rivers

whether it be by the sluggish, winding Lea in Hertfordshire or the turbulent Wye in Hereford. The conifers grow best on light, sandy soil and a great variety of firs and pines such as the Douglas and other spruces, the silver and Austrian fir and the larch have been rapidly multiplied wherever the land seemed suitable for afforestation. In practice those who plant for ornament find that most trees will grow sufficiently well in any county. The giant sequoia or Wellingtonia, the quaint monkeypuzzle, the flowering catalpa and tulip-tree, the American oak take kindly to scores of gardens, as the wild mountain ash will flourish in suburbs or the Lombardy poplar on midland clay in the driest quarter of England. It was not fully realized till the Second World War quite how large was the population of timber

trees in Britain, but when the import of timber was cut off home supplies were exploited to the full and England, to the surprise of the Government, became almost self-supporting in hard woods. Oaks of good size and girth were found to be multitudinous in the hedgerows, parks, spinneys and little woods. The widely scattered trees made up for the lack of forests, even though singularly little use was made of the elm which is comparable to the oak in distribution.

Wooded Hedgerows

The beauty of the English scene owes a great deal to the hedgerow which sometimes is like a strip of woodland; and these hedges have to some extent made yet more difficult the not very clear distinction between tree and bush. You find in the hedges oak, elm, ash, beech,

YOUNG OAK TREES SHADE THE LANES. *The oak flourishes in hedgerows, and although this tree usually grows to a considerable size the young tree is rarely choked by the close proximity of other hedgerow plants and bushes.*





BUILDING A HAYSTACK IN A SHELTERED SPOT. *Elm trees grow in groups from the hedgerows and afford a certain amount of shelter from wind and rain. Although they are considered treacherous they make attractive patterns in any landscape.*

maple, cherries, crab-apple, hornbeam and thorn, which are true trees in nature, however much deformed by cutting. Among them are hazels, elders, hollies, spindles and blackthorn, which may be trees, but may quite well resemble bushes, such as the guelder, the way-faring tree, the white beam, the privet, the barberry and the plum. You may make almost any tree into a bush, as we see in our gardens, where the holly and those great and splendid forest trees, the beech and yew, are favourite hedge-plants. It is not easy to find any definition of a tree; but its essence lies in the existence of a single trunk or bole, from which branches jut out some little way above the ground. Of forest trees in the full sense of the word we have only about a score of species that are

accepted as genuine natives. About as many alien trees have been widely distributed, and many more, especially in the class of evergreens, are to be seen in parks and gardens.

A procession of all our denizens would not take long to pass by. First would come the two oaks, the so-called sessile and pedunculate, coloured at first a ruddy bronze and perhaps still bearing an old leaf or two from last year. By the time its colour was showing, the elms would be in tiny green leaf just beginning to cover up the fading flowers. The wych-elm probably would be brilliantly green yet earlier, not so much the leaf as the green, flat cases holding a red seed towards the middle. Among the elms would be the Dutch elm (with rather larger leaves) and a number of scarcely



BIRCHES—SHERWOOD FOREST

distinguishable varieties. A place hardly less eminent belongs to the beech, of a brighter green than other trees in spring, of incomparable copper colour in autumn, and showing a singularly smooth and vivid trunk during winter. The ash, whose white, long-fibred timber is as valuable as the hard, dark-coloured beech, is useful for furniture, and is one of the hardiest of British trees, though its reluctant buds may still be black and unbroken towards the end of March, and though its half-blackened leaves may fall at the first hard frost of autumn.

No other tree in southern England is quite so important as these "big four"; though some others are as widely spread. The slender and graceful birch which has two varieties, has a strong and lasting wood; and though it grows naturally on Scottish hills it is found also in quantity in marshland in west Scotland and on a famous marshy watershed in Radnor. The drooping grace of its slender boughs and white trunk make it a favourite in gardens. The lime is beautiful, mainly for the regularity of its form which makes it much used for avenues. No other native tree has so sweet-scented a flower; and though the leaves are among the earliest to open and to wither, the flower is not at its best till mid-June. It is the source of bast, very popular with gardeners, a sort of tape or string made from the inner bark of these trees.

The Poplar Family

The biggest group of natives in species and variety are the poplars, the tall, branching black poplar, the white poplar, the hybrid grey poplar and the slender aspen. The willows, with the sallows and osiers (those willows especially used for basket-making), are yet more numerous. Some of them have local names, such as the Bedford and Huntingdon, or white willow. A common sort is the crack willow, so called

because its twigs break off easily, and the goat willow which is the commonest of all and is easily known by the purple tint of the branches and the whitish down under the leaves, which are rather broader than in other willows. Though all willows like a moist site they are often found in hedgerows.

The Maples

One would expect the sycamore to be in this procession, so thoroughly established is it in all districts, some of which might be thought singularly unfavourable; but it was not introduced into England till the fifteenth century. We have, however, one native belonging to the same family, the maple, found more often as a hedgerow bush than as a tree. It is rather like a very small edition of the sycamore in all respects; but the leaf turns to a gold or occasionally a ruddy hue in autumn. It cannot compare with the scarlet of the Canadian maple, but makes a pleasant addition to the autumnal coloration. It is a tree that shares the bush-like habit frequently marking the hawthorn, the elder, the spindle, and the hazel. In the column of native trees would be ranged several fruit trees, the crab-apple, the pear, the medlar and the wild cherry, as lovely in its autumn leaves as its spring flowers; but it has even less edible and smaller fruits than the others. With these (for they too are brightly flowered, brightly berried and rather small) may be grouped the rowan, seen at its best in Scotland; the white-beam, which is of the same family and not unlike the rowan in blossom and fruit, easily distinguished by the white down that covers both the young shoots and the leaves; and lastly the service tree, which is of the pear family, though the leaves are deeply and beautifully lobed almost like a maple. It is rather rare and never found, it is said, in either Scotland or Ireland; the tree, of a



WILLOWS IN THE SUFFOLK MEADOWS



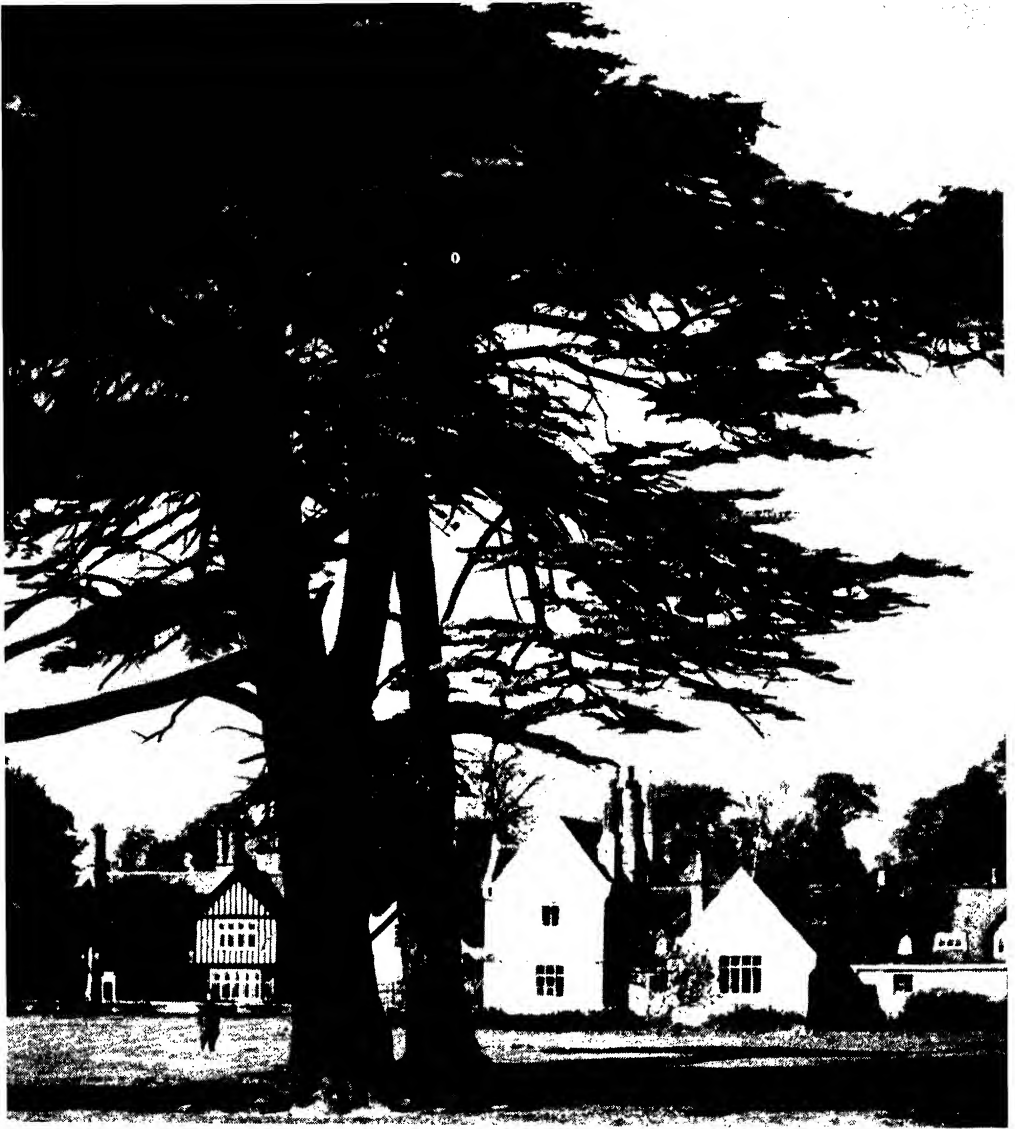


CEDAR TREES IN RICHMOND PARK. *Because of its beauty and stateliness the cedar of Lebanon has always been a subject much appreciated by poets and artists.*

fair size, exists here and there in many southern counties, in Surrey and Oxfordshire and in a number of gardens in other counties.

The native evergreens make a very small group; there is just one evergreen climber, "the bonny ivy tree". There is only one tree conifer and one bush

conifer, the juniper, whose cones are usually but wrongly called berries. The yew and the holly, both unmistakable and unmistakably British, very nearly complete the list. The box is, as a rule, found in the form of a bush; but at Boxhill, the one place where it has been common, it usually is seen in the form of a tree.



It is cultivated in parks and gardens in Europe for ornament only, and although it thrives well in such surroundings the young plants are frail and dislike cold.

Most trees are rather shorter lived than is generally thought. The ash and the sycamore have reached old age at 200 years. Poplars and willows have yet shorter lives. Even the hard-wooded hornbeams and elms seldom reach beyond 300 years or so, though there are some notable exceptions. The yew far

excels all other trees in longevity, with the exception of the oak, and possibly the Spanish chestnut. Dryden was near the mark when he wrote of the oak:

“Three centuries she grows and three
she stays,
Supreme in state and in three more
decays”.

Some oaks and certainly some yews attain to a thousand years of life. Old yews, of which the Selborne yew is among the more famous, are to be found in hundreds of churchyards where it is said they were once planted for the provision of wood for bows.

Trees have been introduced into Britain at many dates, beginning with the Roman conquest. It is argued by some botanists that even the field elm is not native, but came from Italy with the early Roman invaders; and others argue that the very widely spread black poplar is more rightly named the Italian poplar. Certainly imported species, even if the rarer garden sorts are omitted, are more numerous than the natives, and the majority, from whatever continent they come find our soil and climate sufficiently congenial to put forth healthy plants.

Evergreen Leaves

In the ranks of naturalized trees the conifers may be put in the forefront. They are sometimes arranged in five classes: (1) The true pines, with evergreen leaves in clusters of two, three or five, and hard cones with persistent scales. In this class, to which our one native conifer properly belongs, are included the pinaster and the large Weymouth pine. (2) The spruces, which have shorter leaves arranged singly. The common or Norway spruce was probably the first to be introduced and was the most widely distributed, but the new afforesters have planted very large quantities of the Douglas spruce. (3) The firs proper, which have flatter leaves; while the spruce cones hang downwards, the fir-cones proper stand upright. Of these the silver fir is the most noticeable. (4) The larches, whose leaves, arranged in close clusters are deciduous. (5) Last come the cedars, with which the deodars are associated, they are found chiefly in gardens; and in some which have proved

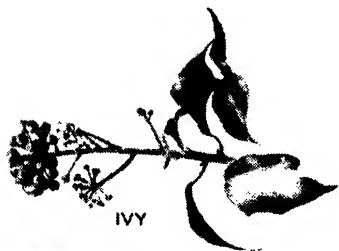
especially congenial, they have grown to a greater size than the present cedars of Lebanon. They have short evergreen thickly clustered leaves and singularly tight upright cones of a large size. Many have the habit of developing immense branches close to the ground, after a fashion sometimes seen in the Weymouth pine.

These five classes are not always acknowledged and are even denied in popular speech. People usually speak and write of the Douglas fir, and our Scotch pine is most often called the Scotch fir. The tallest of the conifers is among the most popular in gardens, the wellingtonia or sequoia distinguished among other peculiarities by the abnormally thick but singularly soft bark. The boughs, often starting from very close to the ground, assume the pyramidal form in great perfection, common to many conifers. In western America it may grow to 300 feet and live for over a thousand years; and these huge old trees may be bare of boughs up to a considerable height. As large a tree and as long-lived was imported into England about the same time, the redwood, which also is a sequoia, but it has given no sign of growing to any great size in our climate. Its soft feathery foliage is sharply contrasted with the hard spines of the wellingtonia. Yet another garden conifer that begins to be popular is the cryptomeria, usually called Japanese, but it may have been bred in England from New Zealand seed. The lower boughs often droop to the ground and then raise themselves abruptly. The stalkless leaves arranged spirally and very close together point forwards and are much smaller towards the tips.

Among naturalized forest trees none has so salient a display of flower as the horse-chestnut. The upright pink and white blooms have often been described not inaptly as candelabra. No tree grows



BARBERRY



IVY



BOX



PORTUGAL
LAUREL



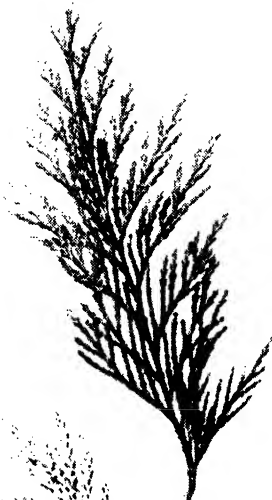
LAUREL



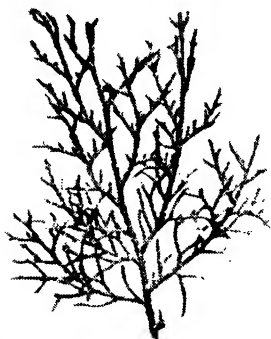
HOLLY



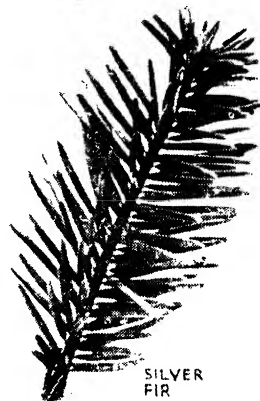
LAURESTINE



LAWSON
CYPRESS



ROWAN CYPRESS



SILVER
FIR



WELLINGTONIA

more quickly in the early part of the year, but the growth stops with curious suddenness towards the end of May, and the broad leaves may begin to turn brown as early as July. The trunk, which is usually short, will sometimes carry an enormous number of heavy boughs. The tree has been very widely planted all over the country, since it was introduced from Asia in the sixteenth century. It was given a misleading name, for it has no relationship whatever to the true Spanish or sweet-chestnut, which became naturalized in England a great many years earlier. Probably it was introduced by the Romans, who got it from the Greeks, who got it from Asia Minor. This fine forest tree has one of the hardest of woods, while the horse-chestnut has one of the softest. A large proportion of the trees has the peculiarity of showing a spiral pattern on the trunk. Unfortunately it is much less willing than the horse-chestnut to ripen its nuts, which are at first held in a spiny green case that has a certain superficial likeness to the spiky casing of the horse-chestnut.

Another important and well naturalized tree that often bears a likeness to the oak, at least in its winter form, is the walnut, which has the oak's habit of sending out wide and nearly horizontal boughs. However the light colour of the bark is enough to announce its identity even in winter. Contrary to some public statements, it ripens its fruit well, at least as far north as the north midlands, though the spring shoots, often purplish in colour, are apt to be cut by early frosts, as may befall also our native beech and the exotic mulberry. It was very unfortunate that quick-growing varieties with small and inferior fruits were spread widely about England late in the eighteenth century. The sycamore, like the horse-chestnut, is remarkable among naturalized trees for the efficient multiplication of its seedlings. Its

botanical name is *Pseudo-Platanus* or false plane, and its broad deeply cut leaves closely resemble those of the plane, though the ruddiness of the stalks at once distinguish it. Its common English name, sycamore, literally means fig-mulberry and it was so called from a fancied likeness to a Palestine fruit-tree.

A Familiar Tree in Cities

The plane is perhaps the one sort of tree more familiar to town than country dwellers. The species was intensely admired by the Romans as many references show; and there is a tale that Darius, about to invade Europe with a vast army, put off the day because he fell in love with a particular plane tree in Lydia. Two sorts flourish in Britain, the oriental plane, which has the smaller leaf and seed, and the occidental plane, which has so deeply-cut a leaf that its shape was compared with the map of southern Greece. Both sorts have the habit of throwing off panels of the older bark.

Another tree that has been planted in towns in spite of its size and rapid growth is the *ailanthus* or tree of heaven, which has compound leaves of the pattern of ash leaves, but almost as long as sumach leaves. In one garden a very large specimen used to grow alongside a tulip tree of about equal size. A number of the latter were introduced into many gardens especially in Hertfordshire rather less than a hundred years ago. The origin of the name is doubtless a certain likeness in the upright flower, which always grows at the end of the shoot, to the garden tulip; but even the handsome flower is less distinctive than the leaf, which has broad lobes at the side, but the top of the leaf is a straight or slightly dented line, making an oddly truncated pattern not seen in any other leaf. Another flowering tree becoming more popular with gardeners is the much smaller *catalpa* which grows to about the



THE LOMBARDY POPLAR. *This tree is a familiar feature of flat landscapes. The name is derived from its abundant growth along the Lombardy rivers where it springs naturally from seeds and grows rapidly to a considerable height.*

same size as the laburnum. Good examples of it are to be seen in Gray's Inn and Battersea Park. The fact that leaf buds seldom grow from the end of the shoot cause the boughs to form an almost bushlike head. The catalpa came to us in several varieties from Asia.

New varieties of our native as well as of naturalized trees are being continually added to the list. Among the more popular are the copper beech, the purple beech, the pink-flowered horse-chestnut and the red double-flowered hawthorn. The cut-leaved lime is another example. The many oaks that have been introduced are for the most part true species, of which one of the handsomest is perhaps the Turkey oak, seen in great perfection in Kew Gardens. Most of these oaks are more or less soft wooded and the large leaves may turn a gorgeous red in autumn. They almost rival the Canadian maple, another popular immigrant. Canada, too, has supplied us with one of the fastest growing of all the many poplars. The Lombardy poplar resembles the black poplar only in the shape of its leaves, but its boughs have a distinctive upright growth.

The Purple Haze of Spring

As you look over the landscape towards the end of winter the woods, and some individual trees, appear to grow purple rather than green: and colour deepens over the landscape. This is due at first to the swelling of both flower and leaf buds, which brighten a little in colour as the sap rises and the cases loosen; but a little later the colour is suddenly enhanced by the opening of flowers. On a good many trees the flowers precede the leaves. Everyone notices this on the blackthorn bushes which as a rule are snowy white before a leaf breaks. On cultivated plums and the myrobalan plum there is often a race between flower and leaf; but the flower

generally wins. Hazels usually show the earliest of the blossoms. The so-called lambs tails or male catkins are found in autumn and frequently produce pollen and begin to look golden in January, also when spring is early you may find the small inconspicuous crimson female flowers. Some of the willows and salallows are not much later; and in March many poplars are a gorgeous purple with their long catkins. Such early flowering is less noticed on the elms; but no seasonal event so alters the general colour of many woods as the opening of their early flowers. They are not conspicuous, are subdued in tint and in most varieties are barren; but the mass may perceptibly alter the colour of the landscape, coalescing with a slight brightening of both stalk and expanded leaf bud and producing a haze of colour.

Catkin Bearers

Much the biggest group of trees is in the group of catkin-bearers (Amentaceae), and these are usually among the earliest to flower. The catkin is of course the flower; but one of a particular type. In general the shape is a tassel, and the least observant of countrymen is very familiar with the catkins of the hazel, a hedge-plant which may become a small tree, and is almost as widely spread as the thorn. The tassels may be taken as a type of most other catkins. The many blossoms on the tassel are, so to speak, half flowers. A full flower, for example, on a blackthorn can both produce a fruit and fertilize itself. It is both male and female. The stamens produce the pollen, surrounding, as a rule, the pistil below which the future fruit is formed. The catkin-bearers usually not only possess two sorts of flower, one wholly male, the other female, but the two often form at different dates as on larch and hazel. The happy fact that both sorts of flowers appear before the leaves, makes it more

CATKINS ON A SALLOW. *The formation of catkins male and female varies considerably on different types of trees.*

sure that they will receive the pollen scattered abroad by the male catkins, and the amount of this is astonishingly generous. It makes assurance doubly sure. Perhaps the most remarkable example of such largesse is to be seen on yews. Tennyson describes yews in springtime as "smoking"; and if you shake a bough or bush at the right season you might think that it was full of dust: clouds of light-winged pollen pour out.

The catkin-bearers have two sharply distinguished divisions. On hazel, oak, beech and others the two sorts of flower are borne on the same tree. On others, especially the poplars and willows, both of which are found in great variety, there are female trees and male trees; and not only catkin-bearers are of this sort. The holly is an important example. How many people have bought hollies to plant in their gardens and been disappointed to discover that they bore no lovely scarlet berries? It is necessary to have both male and female hollies moderately near to one another before berries can be formed. Several garden shrubs are admired chiefly for their catkins; but here again it is necessary to procure the right sex. For example, in a poplar bush, the *garrya elliptica*, the male trees have much longer and more handsome catkins than the female. They are often, too, brighter in colour, but catkin colours vary greatly, as was insisted in a very well known passage by Rossetti, which emphasizes the earliness of flowering.

In the wind of windy March

The catkins drop down,

Curly, caterpillar-like

Curious, green and brown.

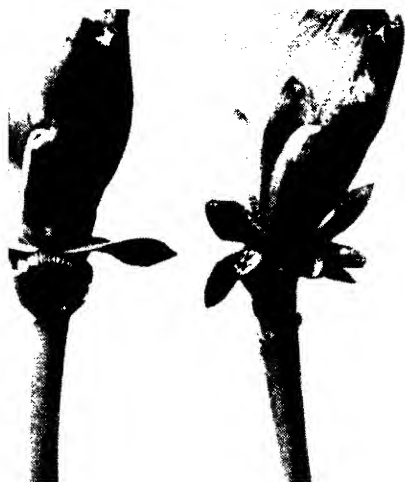
By far the most remarkable when they fall, are the long catkins of some of the



poplars. The ground below the trees may look as if thickly strewn with the bodies of strange red caterpillars. Yet more conspicuous, though later in the year is the ground beneath the poplars. This may be as white from the fluff attached to the fallen seeds as if there had been a heavy fall of snow. The multitude of seeds, mostly barren, is one of the standard wonders of our botany. One pistillate or female flower that may compare with the rich colour of the popular catkins is seen on the larch, which is the only conifer that loses its leaves each year, unless we reckon the garden tree, the deciduous cypress.

The Red Flower of the Larch

"When rosy plumelets tuft the larch" is a Tennyson quotation concerning one of the more striking symptoms of spring in some districts; but in this tree the red flower comes out very much at the same



FROM BUD TO FLOWER. *These photographs show the development of the horse-chestnut leaf-bud into full flower.*



time as the light green leaf. Such simultaneous growth makes one of the beauties of the weeping willow. Very early in spring its vivid greenness is often much the most conspicuous and lovely feature of a waterside scene—for example by Hampton Court—but you must look more closely to perceive that the young leaf and the young catkin flowers are growing side by side and match one another in the greenness of their hue.

Not only fallen flowers make noticeable carpets below the spring boughs. Both the leaf buds and the broader, plumper flower buds of most trees, being formed in autumn, have to endure the cold and rains and winds of winter, and are therefore protected with adequate armour. The outer scales, covering the more tender core, are peculiarly apparent in the horse-chestnut. The buds are big, the scales are often of a rather bright brown and glisten with a sticky gum that caulks them effectively against any extremes and variations of the weather. When the sap rises in spring and begins to force the expansion of leaf or flower, the cases and bracts are forced back and presently, being no longer needed, fall off, sometimes in such profusion as almost to carpet the ground. This fall, almost like the fall of the leaf in autumn, is especially noticeable under horse-chestnut and beech, though the two species have little in common. The horse-chestnut is an imported species with a singularly stout bud and pink and white candelabra of perfect flowers and the beech is a catkin-bearing native with a long, very slender leaf bud.

Though brown is the prevailing shade, the early spring or prevernal buds have their individual tints; and the identity of a tree can usually be inferred from a single



bud. Extremes of colour are seen in the lime, which has a deep purple case, that opens very early in the year, and the ash, which is very nearly black, though just touched with yellow, and is the very last to open. The oak is nearly always open first on trees of any size, though the very young sapling ash may anticipate the oak by a good margin. A certain darkness marks the ash. The flowers are brown tufts, the keylike seeds (given the name of *samara*), are much the same colour and the green of the leaves is darker than in most trees and does not lighten in autumn. It is excelled in darkness of colour only by the alder which in addition has a very dark bark.

No early flower makes itself more manifest nor has a more general popularity than what is called the palm. It is so-called because of the association of palm and willow in biblical passages read on Palm Sunday. One common form of willow or, more correctly, *sallow*, carries very conspicuous male and female catkins on different trees or, as a rule, bushes. The male, which is rather more conspicuous, becomes a bright yellow and the female silvery. The amount of pollen produced is so great and the date of the production so early that it is often planted now, as in classical days, in the neighbourhood of beehives in order to give the bees a plentiful supply of food when first they emerge from their winter rest. A little later, fluff from the silver catkins spreads so widely, that it may drift in considerable quantity even into passing railway carriages.

How different in habit and date is that other standby of the bees, the lime flower. Its sweet scent is spread abroad when most tree-flowers are over, it also supplies the bees with the last honey flow as the *sallows* supplied them with their first food. The young, fed on pollen from the *sallow* have become old and strong enough to gather the lime harvest.

In beautiful districts of England (such as Pershore in Worcestershire) which are clothed in the bridal white of the plum orchards, the growers wait anxiously for the opening leaves to protect the set blossom from the belated frosts that often fall during the early part of May. In the wild cherries which glorify many rural scenes—in Hertfordshire as in Shropshire—the leaf treads more closely on the heels of the blossom; and in the whitethorn or quick or may which lights up the spring scene even more widely and splendidly than the cherry, the blossom may not fully open in late seasons till June, a month or more after the date when “*burgeons every maze of quick*”, that is when the well-pruned quick hedges with their winter pattern break into buds that are at first so light in hue as to be almost white. Yet later the hedgerows (which consist chiefly of trees pruned into bushes) shine with the great white discs of elder and guelders and dogwood; and last of all come the pink and white flowers of the blackberry, often still open in full autumn.

Fruit Growing Districts

The orchards, spreading more and more widely about the country—as in the valley of the Avon and Teme, and as in Kent, Cambridgeshire and Norfolk—are a definite part of the scenery of England, and the fruit-growing districts are worth a special pilgrimage throughout March, April and May. It is not perhaps generally realized—for the wild sorts are much rarer than the cultivated—that pear and medlar as well as cherry and apple, are native wild trees. The wild medlar often has thorns and is very closely related to the quick, though both bloom and fruit are much larger. Curiously enough, little has been written about the wild crabs which vary a good deal in different districts. There are certainly three different varieties. The



APPLE BLOSSOM IN A KENT ORCHARD. *The pink and white glory of apple blossom is much in evidence throughout the months of April and May. This is particularly obvious in the county of Kent where orchards and hop-fields abound.*

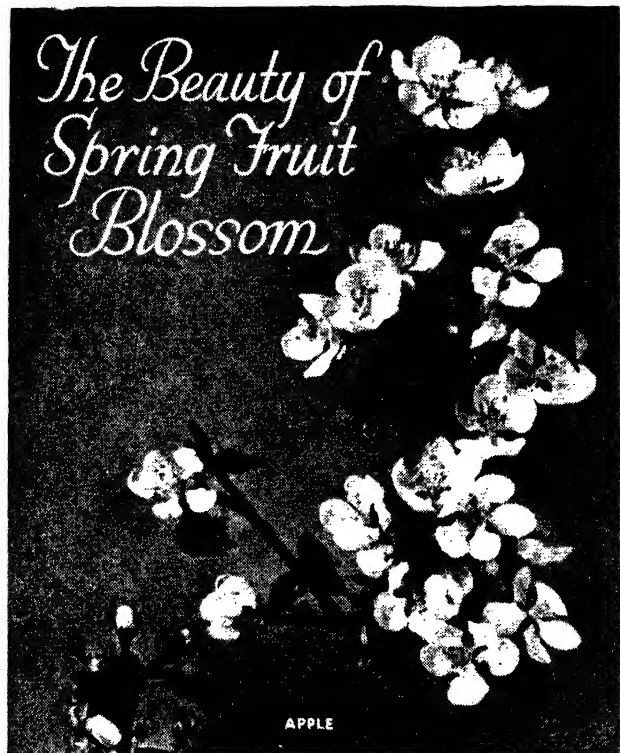
fruit of all is scarcely edible raw but excellent when preserved.

Classification is the duller side of botany and is a branch of knowledge that properly belongs to the specialist; but the classes and indeed the species of trees in England are so few that it is well worth while for the general observer to take some note and be able to place them. A brief summary may be given. The catkin-bearers proclaim themselves and are much the biggest class. Among them it is only necessary to know whether the male and female flowers are borne on the same tree—as in oak, beech, hazel, birch and the rest—or on different trees, as in most of the poplars and willows. The next considerable class consists of those with “rosaceous” flowers, as the

thorns and fruit trees and mountain ash. Outside these, all the groups are small. The elms (which are akin to the nettles) stand alone, as does the butterfly-flowered acacia or robinia. The sycamore and maple are *acer.s.* The elder, guelder, and wayfaring tree belong to the honeysuckle or goat-leaved (*caprifoliaceae*) family. The lime or tilia stands alone, as the curious broad leaf-like wing (or bract) attached to the flower suggests. Technically the rowan, the whitethorn and the wild service tree are like the crab-apple in the class of *pyrus* or pear, while the cherry and the gean, a sort of wild cherry, are each a *prunus*, like the blackthorn.

Lastly come the conifers, among which must be included the juniper. This name

*The Beauty of
Spring Fruit
Blossom*



APPLE



PEACH



PEAR





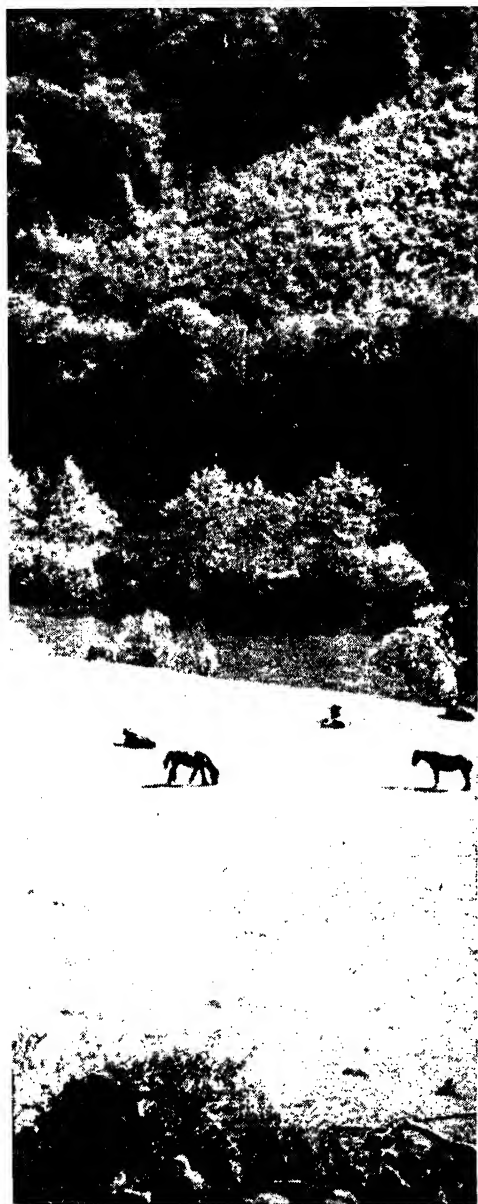
Apple, cherry, pear and plum are the four most familiar fruit blossoms to be found in orchards and gardens throughout the British Isles. The peach is not so well known, for except in the southern counties, this fruit only ripens under glass. Almond blossom is a familiar sight in March, its lovely pink blossom often being the first sign of spring. Parks and roadsides are brightened by this welcome splash of colour which often appears several weeks before the first leaf of spring.



is given to a spruce on the North American continent, but it more properly belongs to the attractive bush native to many English counties. The fruit, generally but wrongfully called a berry, is really a cone, and takes three years to ripen fully.

It is generally recognized that the

crowning charm of the English landscape lies in the very slow gradation of the seasons. There is no very sudden change, though events move most quickly at certain dates in spring and autumn; and at almost all times some continuous movement is perceptible. Spring is very slow in developing into



ASH IN LATE SPRING. *The tapering toothed leaflets on a slender stalk give the appearance of blossoms in the sunlight.*

leaf in late March, "the month", as a very old phrase has it, "that blooms the whins". But as you look round any well-varied landscape even in May, you will notice how dark and wintry many trees remain. There is always a sort of donkey race between the oak and the ash to decide which shall prove the more obstinate to the seductions of spring and summer; and the acacia is as late as either.

Nor is it only the deliberate unfolding of the buds that maintains the day by day change. There are extraordinarily few weeks in the year when the oaks keep the same complexion and expression. The first leaves to show are seldom a true green. The great dome of boughs appears to be bronzed till spring is well advanced, and the tips of the leaves are often an autumnal red. Doubtless we associate greenness with spring. The quick hedges and the elms and the beeches are hardly less brightly green than the alien larches. Nevertheless a great many young shoots, on the brier for example, are at first ruddy; and the theory is that the colour, which will not be seen again till autumn, is a protective shade to guard the tender shoot against scorching. The summer change is not over even when the full uniform is donned.

Oaks, beyond most trees, very frequently send out what are known as Lammas shoots: they enjoy a sort of second spring in September. The species is singularly liable to wholesale attacks by a little green caterpillar, whose pale brown moths will be seen in crowds at a later date. The attack may be so devastating as to reduce the oak to a wintry appearance; but when this befalls, the capacity to develop buds that had stayed latent, is exhibited in full force, and the tree may be covered in late autumn with

full summer, thanks not only to the quietly progressive swelling and opening of the buds, but to the wide interval between the normal, natural dates of some of the commoner trees and shrubs. There are open leaves—almost blue in tint—on the honeysuckle in January. The red buds of the lime break into full

a bright spring-like greenery. Nor is the subsequent fading of this second crop the end. Oak and beech, as we have seen, may both keep an obstinate hold on a proportion of their withered leaves and these will continue to fall at odd intervals till the whole circle of the year has once more been completed.

Full Leaf in June

It is a queer experience in some spring gale to find yourself in the midst of a heavy fall of dry withered autumn leaves; and this may happen under a deciduous oak, as it may also happen under a holm or evergreen oak, though this of course retains a continuous clothing of greenery.

Not till June is the screen quite complete. In that "flaming" month the screen is quite complete, though some subtle enhancement of shade may yet be detected. Many leaves, especially beech leaves, lose or partly lose the silky hairs that just at first protected them, and at the same time stretch themselves into flatter, smoother plates. The brilliantly verdant leaf of the beech becomes singularly smooth and flat during June and attains a brightness of hue far in excess of what has been called its "crumpled veneration" when the silken folds slowly unfold. A single tree will sometimes, with a black June thunder-cloud behind it, leap out into a sudden brightness that quite transforms it.

It has astonished all observers how completely in most trees the upper trunk and boughs and twigs disappear behind the leaves. This is due largely to what even the severest botanists call "the mosaic pattern"; and few features of a tree have been more fully illustrated by photograph and diagram. Such a mosaic is rather more perfect in some species than others. The maples and the ivies perhaps give the best examples. You may find broad, crowded patches where every

leaf is exposed to the light, and though there is no crevice whatever in the mosaic, the overlapping is at a very low minimum. The shade beneath the tree is not dappled, as is the shade beneath the evergreen gum trees of Australia—in which the front of the leaves avoid the sun. It is so dense that scarcely a point of light penetrates; and in consequence, few green plants of any sort can survive. Beneath beech and sycamore the grass is often killed and no bush survives.

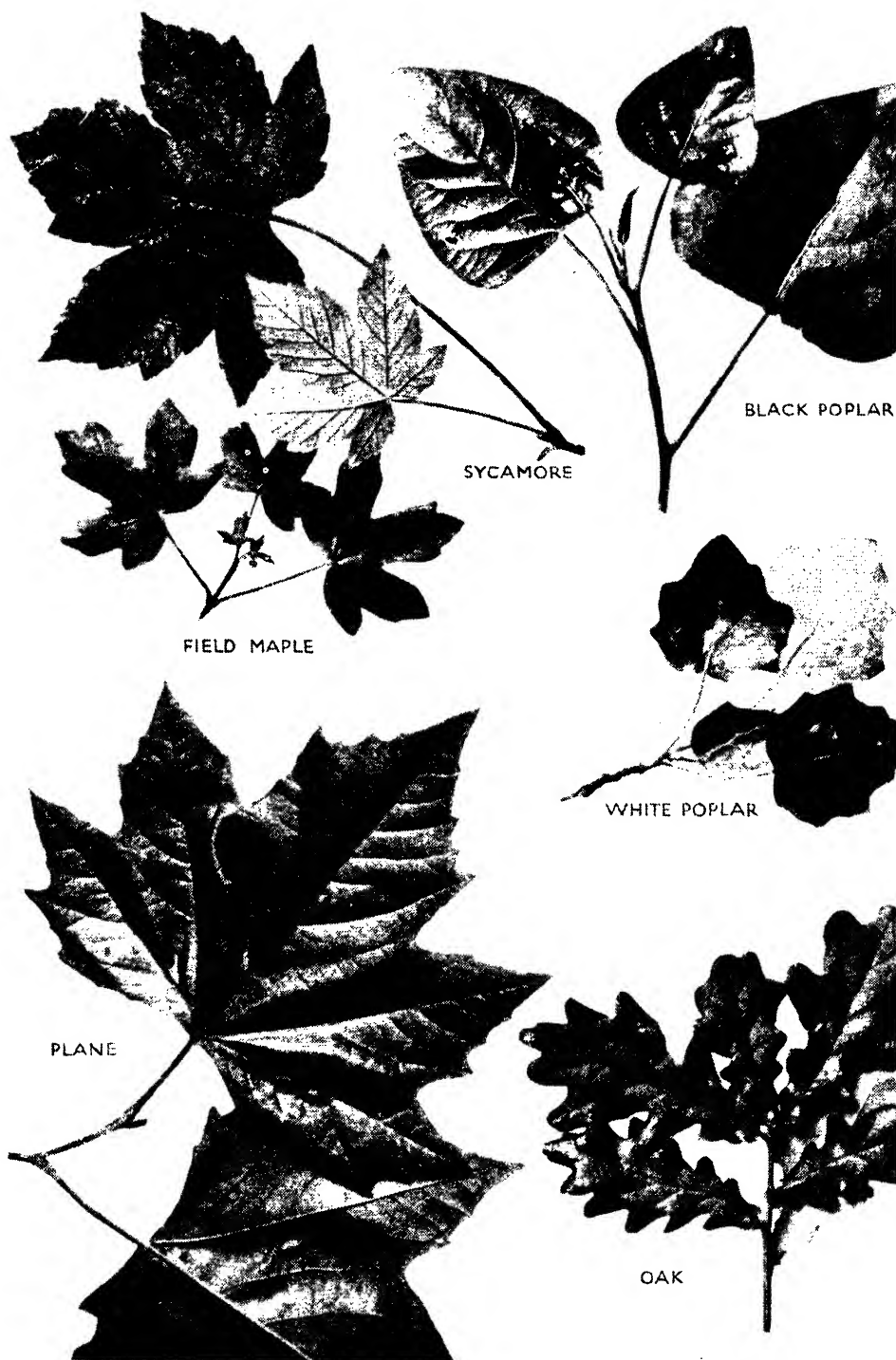
The methods by which the leaf mosaic is formed have much exercised the minds of botanists. The most essential reason, doubtless, is the arrangement of the buds on the stem. Because they are in spirals or when in pairs alternating at right angles, the leaves tend to avoid their neighbours' living space. But this is not the whole story. Each leaf has a thirst for the sun, so to say, and struggles towards the maximum of illumination by various agencies, such as by the lengthening and twisting of the leaf stalk and the adaptation of the angle of the leaf, which may differ a little by day and by night. Since green leaves find it difficult to live without sunlight there is, of course, a tendency for cloaked leaves to die off and for shaded buds not to develop. So it comes about that the very densest screen of leaves (sometimes said to be most complete in the sycamore) is, in fact, comparatively thin. The high proportion of leaves that achieve their place in the sun is due also to the general habit of trees in elongating their lower branches, so that their leaf-covered tips extend well beyond any danger of being shaded by the upper boughs.

In this regard it is worth noting how trees change their shape as they grow older and larger.

It has been seen how the narrowest of all our trees is the Lombardy poplar and others that may assume this fastigate



BEECH TREES IN SUMMER ARRAY. *One of the largest of our forest trees, the beech is of considerable value. Its hard, close-grained wood makes excellent furniture, and the fruit—called beech-mast—supplies food to park deer and other game.*

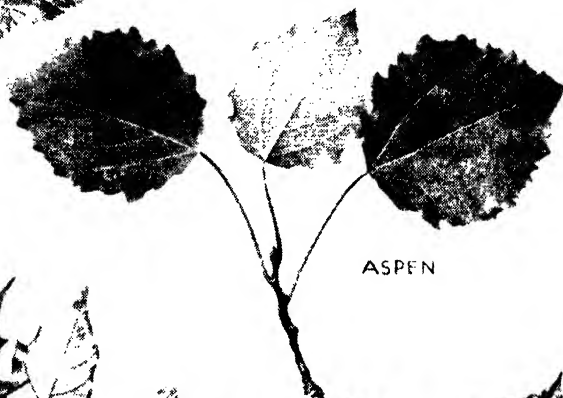




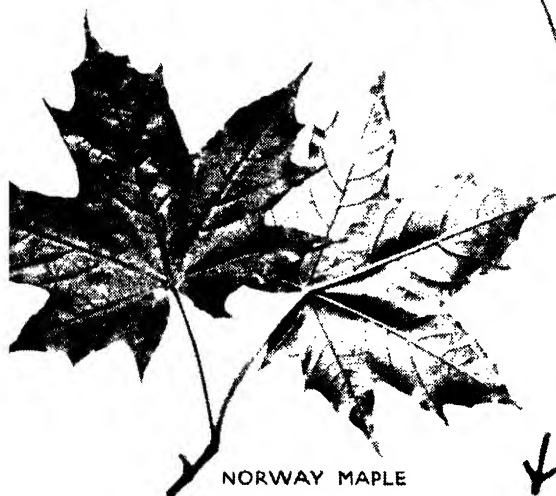
WYCH ELM



EVERGREEN OAK



ASPEN



NORWAY MAPLE



BOX ELDER



COMMON
ELM



BEECH

or upright habit. It is the counterpart of the cypress among evergreen trees. The type of tree that comes nearest to this pyramidal form is found among the conifers. Though the boughs often come out at right angles, they are so nicely graded in length that the general shape is a more or less regular cone. In many of the pines, especially of course where they are grouped closely together, the lower boughs have a tendency to drop off altogether. Hence some of the old firs and pines become the very contrary of their young selves. Instead of pyramids they are converted, as one pine is called, into umbrella trees. The beautiful Scotch pine that gives its distinction to many a Scotch hillside often ends its life with a long bare trunk and a crown of boughs near the peak.

In most of our forest trees a time is reached, while the tree is still in full vigour of growth, when the main trunk ceases to send up a distinguishable central pillar; and the many branches into which it has broken up tend to form a dome, which is peculiarly even and shapely in the lime as compared with any other species of deciduous tree.

The Mosaic Pattern

The demand of the leaves for sunlight touches the very deepest secret in the whole world of life—so their mosaic is worth special attention. The leaf is not in any real sense a separate part of the tree: it is the extension of the twig intimately connected with it, possesses so-called veins and ribs. Up and down the veins flow what is equivalent to the lifeblood of the organism. It is the cause of life in an even more essential sense than the roots. The green colouring matter of the leaf has been said to "bottle sunlight"; but it does more, it changes light and air into food of life and is the only agency in the world capable of this transformation. But for

this act of what is often called photosynthesis, life would cease on the earth.

The inner factory (whose work has been slowly but certainly analysed in thousands of ingenious experiments) is defended by an outer skin (or epidermis) of harder protective tissue, more or less proof against the weather. In this case, chiefly on the under side, are a great number of little slits or mouths (stomata), as many as 300 or so in an ordinary small leaf, and these enlarge or contract in response to the weather and the needs of the plant (as in breathing out excess of moisture). The closely packed cells beneath the skin are separated by thin partitions easily penetrable by water, and these divisions contain as a rule various gases while the cells themselves are inhabited by atoms of protoplasm, and the chlorophyll granules that together perform the great miracle. Into the leaf is sucked and in smaller degree pumped from the roots water containing various minerals, but the leaf (as many beautiful experiments have proved) grows heavier and richer, not only from this source. The leaf takes in carbon from the air in the hours when the light is bright, and converts it (a dead mineral) into the material of life. On a summer's day the leaf is at work taking in carbon dioxide and breathing out oxygen. At night the process is in some measure reversed. The sum of work done by a single leaf during a summer day and the aggregate work done by the complete leafage of a tree are of almost fantastic proportions. The typical leaf is a thin, flat organ exquisitely adapted for the performance of certain primary functions—transpiration, assimilation, and respiration—which depend on its exposure to light and air and the accessibility of gases to its interior through the stomata and intercellular spaces. It therefore happens that trees whose native haunt is on dry or sandy soils and in cold air, transpire in

very limited measure. This is especially marked in most evergreen conifers, which have tough narrow leaves with very few stomata and those often sunk in grooves. Among native British trees the ash and the Scotch pine are put at the two extremes, the pine transpiring about a tenth of the water transpired by the ash. The larch being deciduous is an exception. The hard leathery leaves of such evergreens as the laurels also transpire reluctantly.

In order that this complex delicate process may flourish each leaf must be fully illumined with sunlight.

How what may be called a narrowly local "leaf mosaic", is formed, may be easily seen on a single leaf of the horse-chestnut. As the leaves begin to escape from the bud wherein they were tightly

folded, the more rapid growth of the outer edge rapidly changes the spoonlike shape into a flat plate. The particular sort of leaf natural to the horse-chestnut is known as palmate, that is like a hand. Sometimes the leaves that come out from the one stalk are actually five in number, like the fingers of a hand, but the number varies a good deal and seven is the usual number. However even where the leaflets are most numerous they stand out like an open fan, each as a rule just avoiding any overlapping of its neighbours. It is among smaller types of leaves such as the elm that the most ingenious mosaics on a wider scale may be seen.

As to the shapes of leaves which supply the easiest method of identification, there are two very salient divisions, composite and simple. In the composite, many

THE ALDER THRIVES ON MOIST SOILS. *As with other plants that grow by water the alder keeps its glossy green foliage well into the late autumn, when most trees are already brown and withered. The bark is astringent and is used for tanning leather.*





separate leaflets are associated with a single stalk; and they may be either shaped like a fan as in the horse-chestnut or like a wing (pinnate) as in the ash, acacia, mountain ash, tree of heaven (now much planted in towns), rose and elder. All these are easily distinguished from one another, as from the simple leaves. These latter grow each with its own stalk or in rather rare cases directly out from

the twig, with next to no stalk, as in one species of oak. Each has its distinguishing marks, such as colour, hairiness, and especially the nature of the edge. A score of ingenious terms have been invented to describe the differences, comparing for example the pattern of the edge to a saw, or teeth. The oak leaf has irregular lobes; the sycamore, plane, maple and white poplar have deep indentations,



LIME AVENUE. *There are many famous avenues of limes, perhaps the best known being that at Trinity College, Cambridge.*

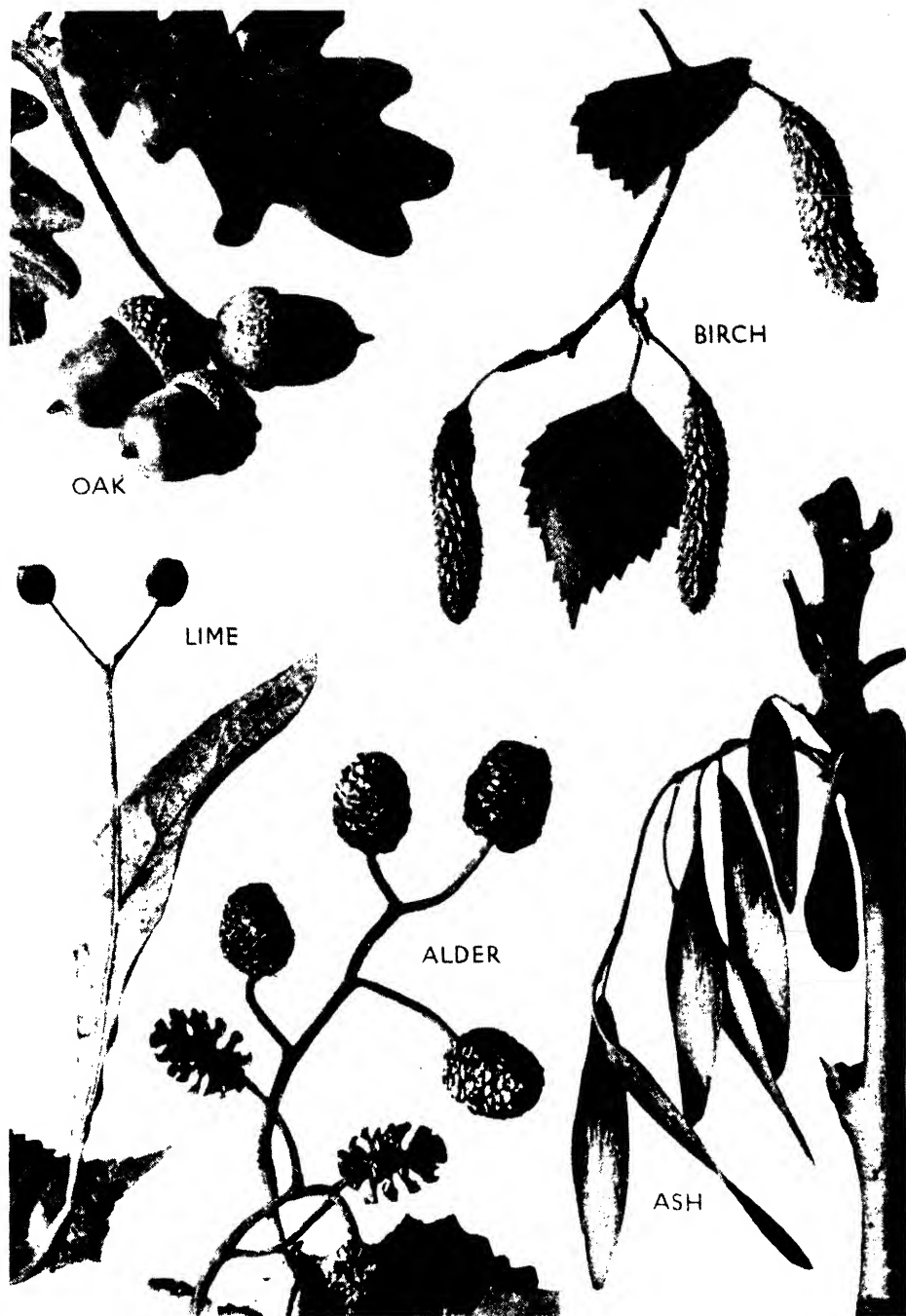
easily identifiable. Though its fine needle-like leaves at once distinguish any conifer from other trees, it needs a special study to make out the different sorts of fir. The needles are shaped a little differently in each species, but the easiest method of distinction is the grouping of the needles. They are in pairs in our one native conifer, the Scotch pine, and one needle is slightly hollowed.

Although the leaves of nearly all our native trees are easily distinguished by their shape, there are a few exceptions. The wych-elm, the field elm and the hornbeam are all alike at a first glance; and need some special nicety of observation. The wych-elm is usually a more spreading tree than the common elm, with stouter and more hairy twigs. The leaves are rather larger and broader; and the stalk is very short indeed. The autumn colour is of a deeper, richer yellow.

The hornbeam, which makes a much smaller tree than any elm, has been described as having elm-like leaves and a beech-like trunk and buds. The edges of the leaf have much narrower, sharper, sawlike teeth and the contour of the leaf is more rounded towards the base. The autumn leaves turn a dull brown very different from the bright ruddy brown of the beech leaf. The masses of key-like seeds which usually hang on very late are quite unlike any other seeds, notably in the close complication of the pattern of each bunch. The hazel leaf, too, has a certain likeness to elm and hornbeam, but it has quite a distinct stalk, described as glandular; and the leaves approach more nearly to a broad oval. They differ greatly in consistency as they grow old and coarsen.

It remains to call attention to one

and the last, like the white beam, develops a white furry cover to the back of the leaf, which makes it quite unmistakable. The narrowness and often silvery colour distinguishes the willows. Most poplar leaves, though not the white poplar, are spearheaded on long stalks. Their length and narrowness and sawlike edges and rather dark colour make the leaves of the sweet chestnut



THE SEEDS AND SEED CASES OF COMMON TREES. Above can be seen a variety of seed forms found on oak, birch, lime, alder and ash respectively.



BERRIES OF THE HEDGEROWS. *In the autumn the hedges are full of berries of a variety of colours. These hold the seeds which will be eventually scattered.*



WINTER SUN THROUGH THE WILLOWS

distinguishing mark of many leaves. They are equipped with stipules. These are sometimes invisible to the naked eye; and may fall off very early in the season. But they are an obvious adjunct of the stalk of a good many leaves. The best example is the winglike plate at the base of the stem of a rose or briar leaf.

Autumn Colours

When the summer leaves, beautiful as they are efficient, have done their work of bottling sunlight, and the lower suns of autumn check their vitality, they begin to alter in colour; but from one point of view this change is not so much decay, as a sign and symptom of a new vigorous process. The leaves have been manufacturing a vital fluid, and this precious fluid is not to be wasted. So when the shorter days come on, it begins to flow back into the twigs and body of the tree. You may often see leaves that have lost all the greenness near their edges, but still retain a green band along the central veins. When this ebb of life is complete, the leaf in all deciduous trees has played its part; its function is completed and presently it falls. But the leaf was a continuous part of the organism vitally connected with the rest; and its removal would leave an open wound.

A curious device has been developed to help the severance and heal the wound. Little studs of cork are formed, and when the leaf falls they make a distinct and distinctive pattern on the twig. The studs, so to call them, are differently arranged in each species and provide one of the means of identification in winter. Their existence perfectly caulks and bandages the broken spot.

Something similar (which has been much less often noticed) may happen with twigs as well as leaves; and small lifeless branches are continually falling from most trees; and in some, especially the willows, this fall is an annual event

that takes place on a considerable scale. The reason is not so much a local malady as a sign of an effort on the part of a tree to get rid of an excess of superfluous twigs, and they fall not from mere decay but because they are quite deliberately rejected by a process very similar to that seen at the base of the petiole or leaf stalk, or in some compound leaves between the leaflets and the central stalk.

To some eyes the most beautiful time of the year is the short period between the departure of the green from the leaf and its final fall. All sorts of brilliant colours leap to the eye: the light yellow of the elms, the deeper gold of the larches, the coppery tint of the beeches, the deep purple of the wayfaring trees, the streaks of red and purple of many shades on the thorn, the spindle, the cherry and the pear, and the duller brown tints of the English oak, though the imported American oak is particularly brilliant. The brightest and most uniform blaze of colour is found perhaps on the Canadian maple, which makes a marvelous flame of colour in its native haunts. Our English maple may occasionally have some share in this splendour but its general hue is yellow rather than red.

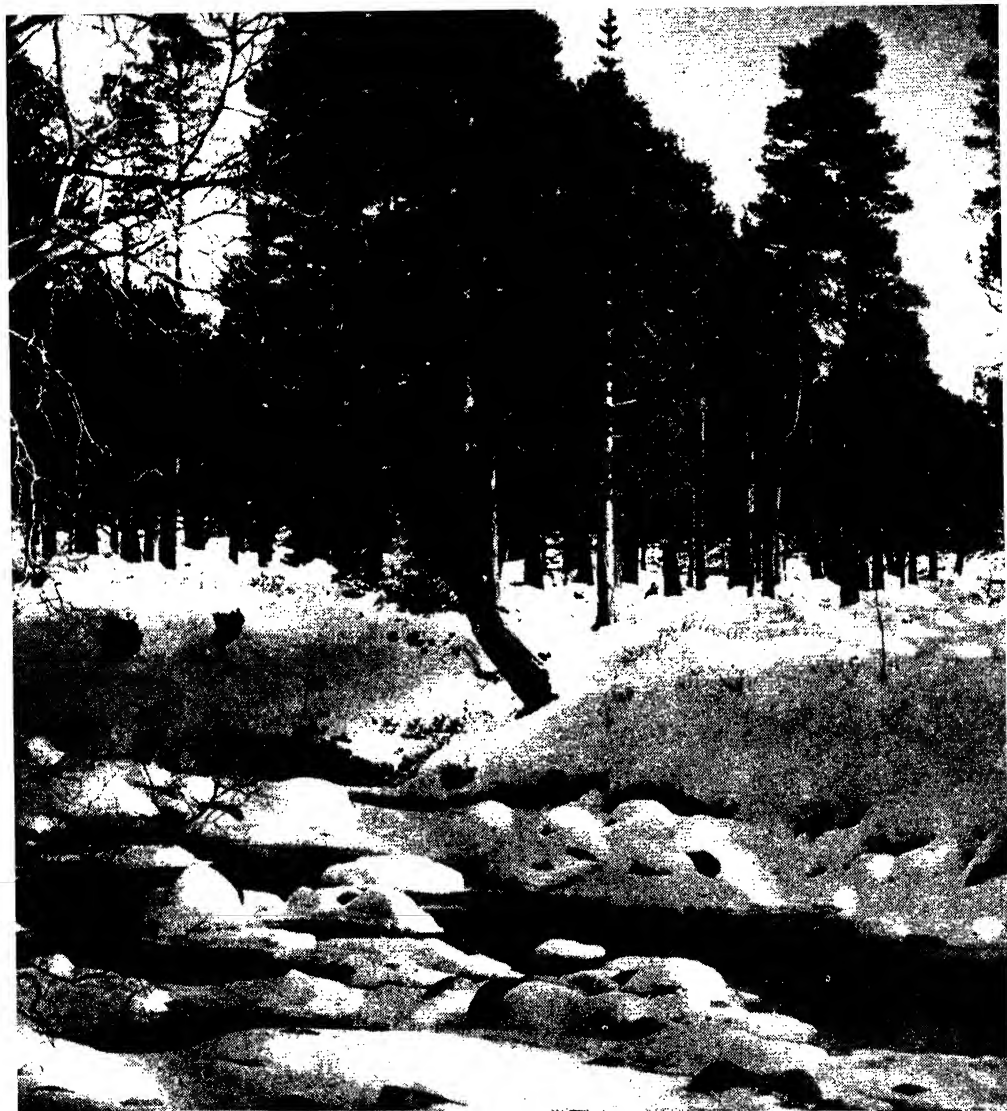
The Fall of the Leaf

All this show of colour lasts a considerable time in most years. The change begins to be obvious in early October or even in September, and the last leaves seldom fall till the second week of November. But different years differ greatly. An early frost, followed perhaps by strong wind and heavy rain may greatly accelerate the process and scarcely allow some species to produce their colours. The big juicy leaf-stems of the compound leaves—as on horse-chestnut, ash, sumach and tree of heaven—are normally much more sensitive than the simple leaves, such as decorate oak, elm and beech. Just as some of the birds that





DESIGN IN BRANCHES



come to us last are the first to leave, so with the trees. The ash may be compared with the swift: it is among the last to break its buds and very often it is among the first to lose its leaves; and they often fall while still green.

The nature of the soil is a deciding factor. Gardeners are advised to plant

certain shrubs, such as the sumachs, in poor soil for the sake of the autumn coloration, and in the wild no thorns planted in good hedgerow soil can compare in autumn coloration with those scrub thorns that have planted themselves in some such barren spot as an old gravel pit. The acacia, like the ash, comes out

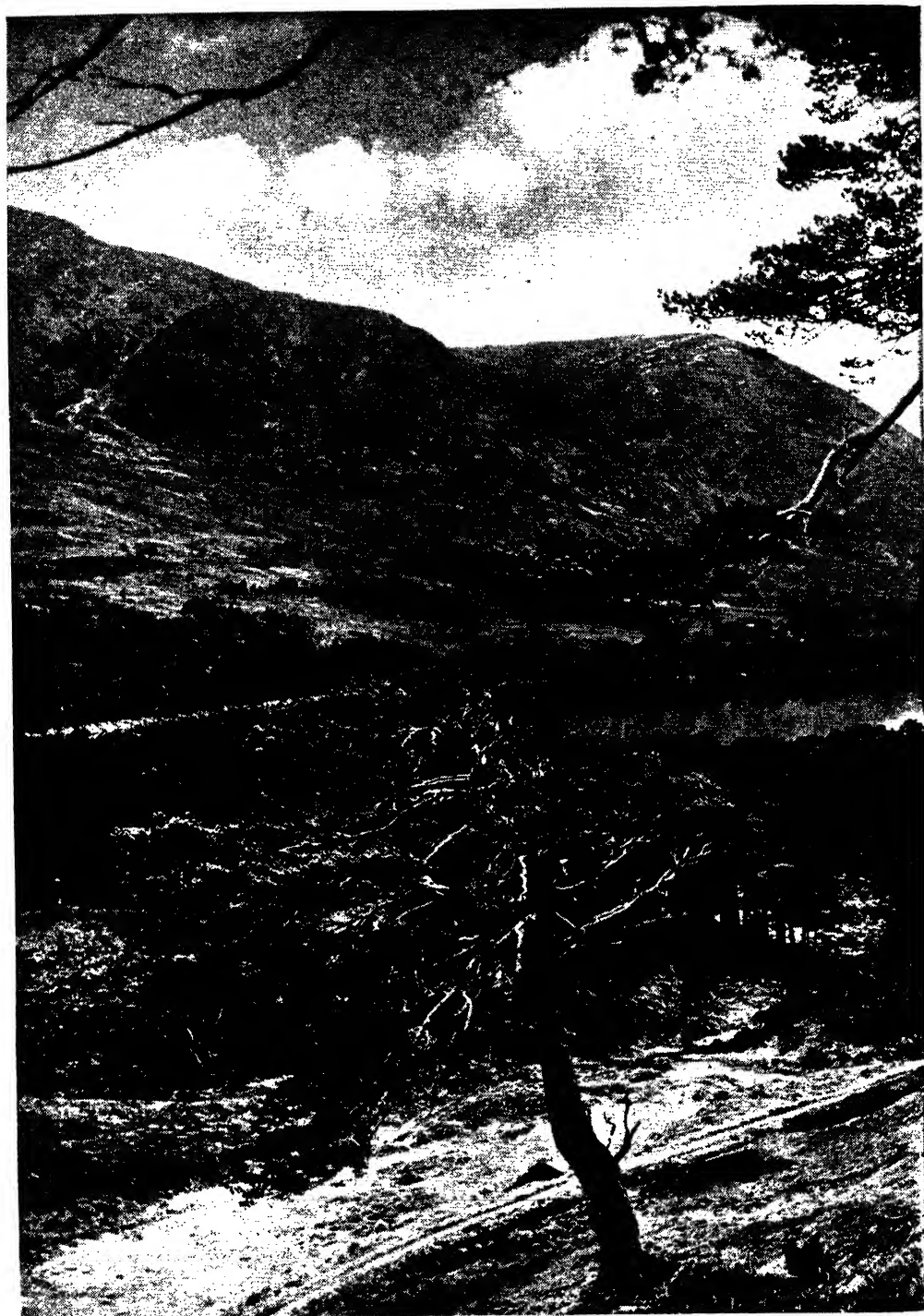


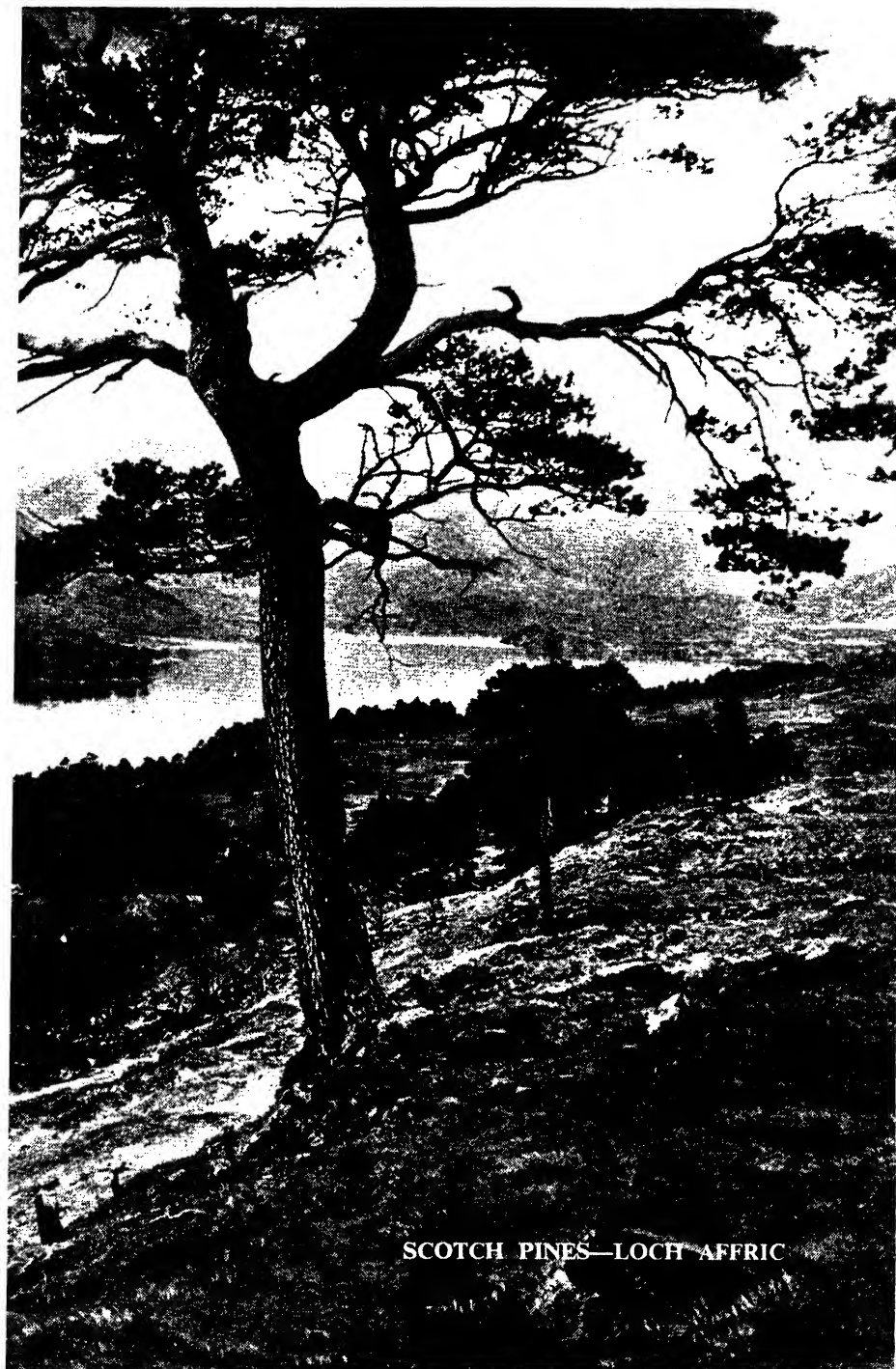
WINTER IN THE PINE WOOD. *The blue-green brilliance of pine trees is beautifully emphasized by snow.*

their withered leaves well into winter are the beeches and the oaks; and it is noticeable that the leaves are held much more firmly by trees dwarfed by the thinness of the soil or heavily pruned, as in garden hedges of beech, by the hand of man. The check to matured growth seems to retard the vigour of the process by which leaves are thrust off. Many fruits survive the leaf and continue to add colour to the world, though this depends in some measure on the birds as well as the season. The hedges, as a rule, are coloured a deep purple with the haws and a bright orange with the rose hips long after the leaves have fallen. The complicated "keys" of the hornbeam look at a distance like yellowing or browning leaves throughout the winter, even if the finches (especially the hawfinches) have been extracting the seeds. Those that most conspicuously combine their colours with the leaves are perhaps the spindles. While each leaf is streaked with various bright patches of red, seed-cases, which are of the colour sometimes called "crushed strawberry", split open and show the brilliant orange seeds.

The question arises, how comes it that these more brilliant colours are evolved. When what has been called "the great emigration" has proceeded some way (that is when the precious manufactured material, the chlorophyll, has flowed backwards into the safe harbourage of the tree), other colours are no longer cloaked. When the leaf loses its verdancy, the little yellow granules of useless material left behind show through the thin skin of the leaf. It is still not clear how it comes to pass that one tree excels another in display of colour, but the prevailing cause seems

late and begins to drop its tiny yellow leaflets very early; but in most years a tree that announces autumn yet earlier is the lime. Its brown crumpled leaves may litter the ground while still even the horse-chestnut retains most of its yellowing leaflets. The only trees that habitually defy the rigours of autumn and keep





SCOTCH PINES—LOCH AFFRIC

to be the degree of acidity in the leaf, and this is affected by many causes. Under any explanation it is certain that the granules which take on the autumn colours are relic substances of no immediate use to the tree. Indeed they may be of definite disservice, and the fall of the leaf is a method of getting rid of harmful chemicals. The dead leaves contain, as a rule, a proportion of lime, especially in such hardwood trees as oak and beech, which partly for this reason are especially treasured by gardeners for the making of leaf-mould. Nature makes her own leaf mould. The fallen leaves not only relieve the tree of what has become useless, but increase the fertility of the soil round about the roots; and a beneficent circle is set in motion.

Autumn is the season of fruits. Some stay on the boughs till late in the winter or it may be for much longer, some, especially the nuts, tumble down about the same time as the leaves. The acorn—or oke-corn—is formed from two parts of the flower, and as a rule the nut itself falls before the smooth cup in which it is held; and one of the common sights in autumn is the search for the acorns half-hidden among the leaves by squirrels, rats, mice and the larger birds, especially pheasant and pigeon, which can hold a dozen or more acorns at a time in their crops. So, too, falls the “mast” of the beeches, and the nuts of both the horse and Spanish chestnuts.

Fruit of the Evergreen

In general the fruits hang for the longest time on the evergreens. The “bonny ivy tree” is the last to flower and the last to ripen the seeds. The holly berries are seldom ripe enough for the birds till after Christmas. The cones of the conifers hang on almost indefinitely, even after the hardy wooden scales have opened to let the light seeds escape. Such cones persist as long on the

deciduous larches as on other firs; and as we have seen, many seed cases, as on the plane and hornbeam, hang conspicuously on the boughs till new leaves begin to appear in spring.

Our Woodland Rides

The woods of Britain are the more lovely because they are open, because the trees are not dense, and glades and vistas expand between them. Over and above this our woodlanders, often at the urgent request of fox-hunters, have usually cut broad ridings through them, and these make the densest easily penetrable and accessible. These “rides” are the playgrounds of wild creatures as well as of people. They have been called the cloisters of a sanctuary. The woods are open; but most open in winter, which indeed is called the open season, beginning traditionally in the second week of November. Since deciduous trees, which lose their leaves every autumn and regain them in the spring, greatly prevail over the few evergreens in all the older woods and spinneys and about the English countryside, winter is by far the most open season to the eyes. You may see a great deal that is shut at other times of the year. In general, shape or form supplants colour. We see the figure and inward structure of all the deciduous trees, and their identity leaps to the eye; but is half concealed by leafage at other seasons. They are then most easy to distinguish, even at a great distance. So the tree-lover and student may very well begin his season not in spring but in winter when the boughs are bare. Yet colour too is more alive than is generally realized: it has not perished with the autumn leaves. The trunks of the trees are nearly all coloured differently, from the dark brown of the alders by the river to the white bark of the birches in the glens; and many take on a new greenness in or about December, for winter

happens to be the springtime of the tiny mosses that especially flourish on bark and exposed roots. To many eyes the beech is the loveliest of forest trees. Under the beech the bright copper-coloured leaves continue to gleam with surprising brightness long after they have fallen.

Only in winter do we see the features of the tree without a veil; and they are worth some study. For the student the form of every species of tree depends, in large measure, on the arrangement of the buds, for all the branches and branchlets start from the angles of the buds. In some trees the buds come opposite one another on either side of the stem, in most they are arranged in various sorts of spiral. Frequently a line drawn up or

down the stem from bud to bud will touch three buds when it has completed the circle. In others it will touch five buds in making two circles. But branches are less symmetric than this plan would suggest, because not all the buds break into growth; and it very frequently happens that the top central bud produces no branch, often, as in the horse-chestnut, because it is not a leaf, but a flower bud. The oak is especially eccentric in this way; and the queer elbows it produces are due in no small measure to the capricious development of the buds.

We may take the extremes of shape to be the Lombardy poplar (which is known as the best example of so-called fastigiate growth) and the weeping willow. Between them comes every variety of

WINTER BY THE RIVERSIDE. *When at last the alder loses its leaves the winter is well advanced and the rich dark colouring of the many branched tree makes a pleasing pattern against the grey skies. Even at a distance the tree is recognizable.*



angle. Most of the poplars send up boughs at an acute angle, for the wood is weak and there is less strain on the more upright branch.

The oak, being one of the strongest in tissue, as a rule, unless it is grown quite close to other oaks, sends out a lower bough or two that is almost as horizontal as the boughs of a spruce. The ash, a most English tree, often begins to develop a weeping habit (as does the slender birch) but the search of the leaves for a place in the sun causes a recovery, and the ends of the boughs (as happens often in the horse-chestnut) rise upwards at their tips, at maybe an almost vertical angle.

The boughs of the elm, which has a hard but brittle wood, rise rather less straightly than the poplar's and form an unmistakable dome, usually narrower than the contour of the oak though this too is dome-like. The ends of the boughs of the beech are as unmistakable as the smooth grey-green trunk. They taper to a fine point and reach out to the maximum in an almost horizontal line.

All dwellers in towns must have noticed the complicated fine pattern of the plane tree in winter round about the dark circles of the queer seed cases. This tangle of twigs is as sure a mark of identity as the slabs of bark that have been pushed off the trunk and left light patches, or the broad leaves of mid-summer.

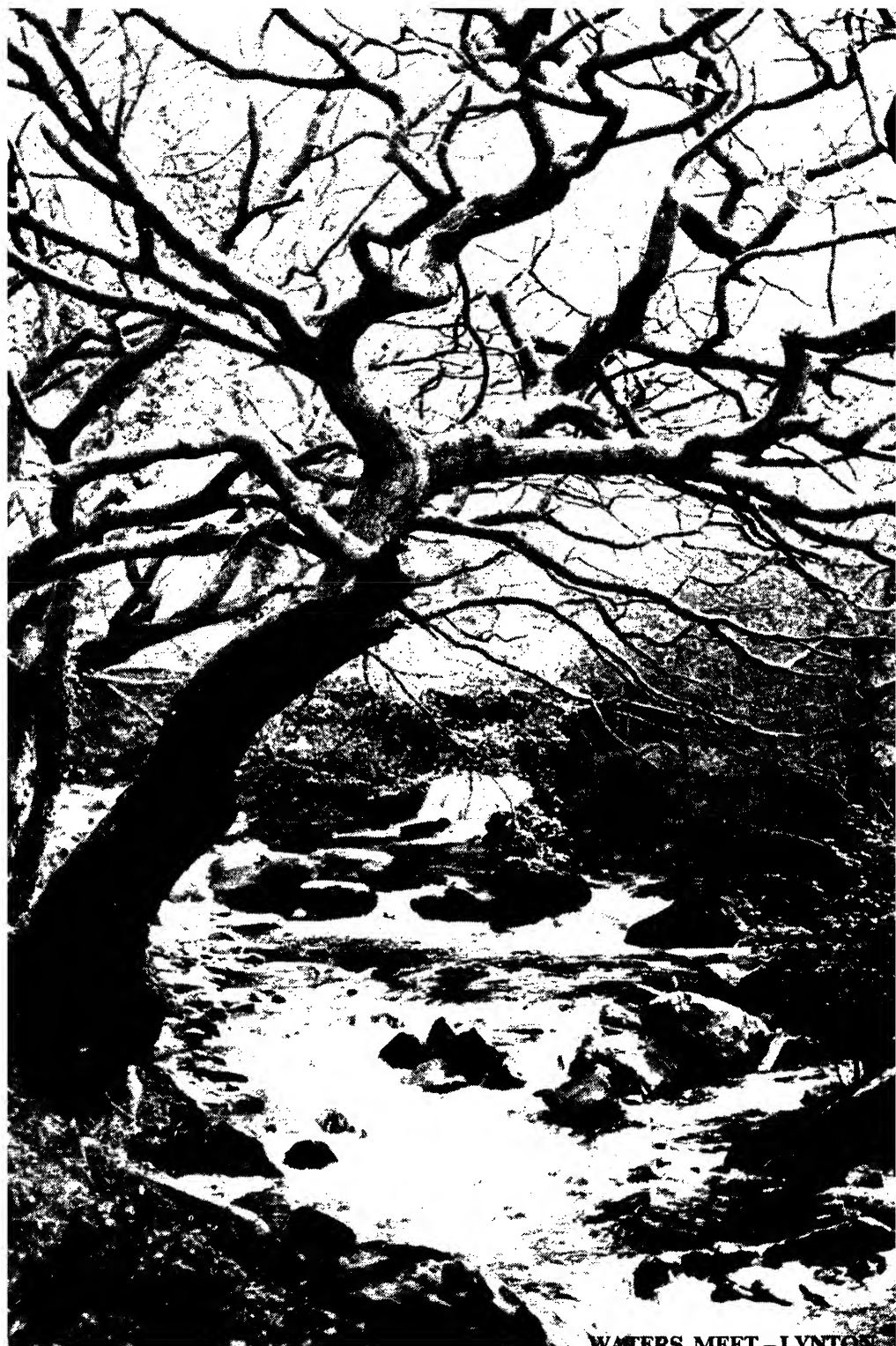
Even the artificial woods of conifers are more distinctive in winter, for just one of them, the larch, now very widely planted, is deciduous; and light is let in when the needles fall. Another alien that is seen in many private grounds—as at Beaulieu in the New Forest—is a little like it—the deciduous cypress, which has a queer habit of forming stools of wood above the roots. The Scotch pine always seems to show up the redness of its bark, though one variety is much

redder than the other, more distinctly when the arc of the sun is low; but in any season it is unmistakable from the handful of other native evergreens.

Fungus on Trees

We have seen that though the arrangement of the buds is tolerably constant in each species, so many influences may intervene that the eccentricities may seem more manifest than the type. Over and above the irregular development of the buds, wind and weather and all sorts of accident, as well as the influence of different soils, have their effects. Maladies of several sorts may produce oddities of growth even on the trunk itself. The faggot of twigs often seen on a beech or what is called a witch's broom are caused by a fungus. The oak "apples" and oak galls which often hang on through the winter are made by an insect stinging the bud, as are the "robin's pincushions" common on wild roses. Most of the great wens on trunks which may produce marvellous and beautiful patterns in the wood are due to fungi of sorts.

On the whole, each species keeps to the rules of its class. Among common trees, the maple, the ash, the horse-chestnut, the sycamore, the elder, the spindle have the scars and buds opposite and the next pair are at right angles, so that one pair of leaves does not cut off the sunlight from its neighbours. As to the buds arranged spirally round the twigs one particular arrangement is common to the longer twigs of the elm, hazel, beech, hornbeam, lime and sweet chestnut. Other forms of spiral appear in the alder, walnut, willow, poplar and our other forest trees. But the regularity of habit is often not perfect in small detail. In the elm, the bud is usually not quite opposite the centre of the leaf scar and in the plane the new bud is completely hidden till the autumn, by the



WATERS MEET - IVNTGE



SPRUCE TREE IN WINTER. *The heavy foliage of the spruce makes a beautiful pattern when covered in snow, for each separate branch is weighed down with its burden of glittering crystals, turning the whole into an alabaster-like form.*

scabbard formed at the base of the leaf. Very often two buds jostle one another in the axil of one leaf. Examination of such details is chiefly for the student, but the general tree shapes are easily distinguished. Here we find that one is more spreading like oak and beech, one more upright like poplar and elm, one inclined to droop like ash and birch, one is deciduous and one evergreen, and each of these may lose its leaves at different intervals: oaks, and less often beeches, keep their withered leaves through most of the winter; the holm or evergreen oak often throws off old leaves in a more sudden and definite rejection than other evergreens.

It has been said that the only landscapes within England that are dominated by evergreens are under artificial cultivation. Neither holly nor holm-oak is sufficiently massed to overwhelm the deciduous trees, except where the Forestry Commission has got to work, or where the hills round artificial lakes have been planted, or where various national authorities have taken a hand in planting areas of the Royal Forests. Many of the conifers, and not least the Scotch pine, which is among the most beautiful of pines, sow themselves freely. That less attractive variety of the two

sorts of Scotch pine, which has a grey, rather than a red trunk, is easily recognizable by its habit of growth, which is much less regular than in most conifers.

The holly of course is peculiarly associated with winter, as it was in Roman days and perhaps yet earlier among the Druids. By a happy accident the bright coral berries are distasteful to birds till they have endured a succession of frosts, and so are usually left to brighten the winter scene till after Christmas Day. This tree was a special favourite with John Evelyn though his prime admiration was for the holly hedge rather than the holly tree. One of its happy qualities is that it can endure shade, and so adds greatly to the beauty of many of our woods. Often it is the only tree or indeed other plant, that is found under the spreading branches of the beech. Curiously enough, it has a rather thin, smooth bark, often sparsely dotted with small round knobs, that give it in this regard a certain likeness to the beech. Happily, too, it seeds freely and, thanks to the birds, scatters its seeds widely; and though they do not germinate quickly they may come up very freely in the second year, in this particular resembling the white thorn.





BANK VOLE VENTURES
FORTH IN MARCH



WILD LIFE THROUGH THE SEASONS

So far as wild creatures are concerned, the year certainly does not begin on 1st January. That is purely an arbitrary date selected by ourselves for our own convenience, and the only outward sign we have that a new year (and a new month) has commenced is found on our calendars. Wild creatures have no such indication: their year is governed by the seasons, by food, temperature and weather. And like the farming year, it begins in the autumn.

It may seem that the autumn is an odd season to begin with and that the spring would be better. But it is with autumn that preparation for the busy time of the year commences. Animals and birds, and the vast majority of insects, have finished with the business of finding wives and rearing families, and are preparing anew to face the same arduous business again. The birds have moulted, those that winter abroad have departed, and those that do not, settle down to a comparatively quiet time.

So too, with the animals and insects, many of whom sleep the winter away after they have eaten heavily of the autumn harvests, in order that they may

reappear fresh and strong to face the tremendous struggle of spring.

Mice, shrews and rats are everywhere in autumn. Every autumn many shrews are found lying dead by the roadside. There are three sorts of shrews in Britain—the common shrew, the pigmy shrew (our smallest animal), and the water shrew—and it is usually the common shrew that we find dead. They have, almost invariably, died a natural death. Shrews have a very short life—fifteen months at the most—and in the autumn they have attained their allotted span. Most animals creep away to die in some very secluded spot: the shrew seems deliberately to do the opposite.

We have two sorts of rats—the brown rat and the black rat—and three sorts of mice—the house mouse, the long-tailed field mouse and the harvest mouse. Then we have the voles, which are often mistaken for mice or rats, the bank vole, the short-tailed vole and the water vole. Finally we have the dormouse. Of these mice and voles there are all sorts and local races, some of which (like the yellow-necked mouse) are sometimes regarded as quite separate



THE COMMON DORMOUSE. *Sleepy in daytime, the dormouse wakes thoroughly at night and moves with great agility.*

species. The dormouse, having fed enormously on fruit, nuts and insects, retires to sleep about the middle of October and does not wake up again until the middle of April.

All the other mice and rats sleep a good deal in the winter but do not hibernate, and those that come into our houses are thoroughly active all the time, particularly at night.

It is because they are nocturnal that one sees them so rarely, but examination of the fruits of autumn, and particularly of the nuts, will show many traces of their activities. A nut with a neat bevel-edged hole in the shell and the contents extracted shows that mice have been at work: a nut with two or more holes or narrow grooves is the work of a dormouse: a nut with a section of the shell ripped out is the work of a squirrel. By examining the fruits of autumn a very good idea of the animal population of a district can be obtained.

The black rat is a town rat, and is so rarely seen by most people that it has acquired the reputation of being rare. Actually, it is altogether too common, particularly in seaport towns. The brown rat lives anywhere and everywhere. Its numbers are enormous, and it is a very dangerous enemy of mankind, not only because of the food it eats, but also because it fouls much of the food it does not eat. It is also a carrier of disease. Many brown rats live in the hedgerows and ditches of the countryside and their tracks in the soft earth or in the snow are easily visible.

We have two squirrels, the grey and the red. The red, a native of Britain, is the smaller and the prettier of the two and is becoming scarce; has indeed disappeared from large areas where formerly it was common. It has been driven out by the grey, a larger and much more powerful animal (a big dog squirrel has been known to kill a good sized cat)

which was introduced from America.

The grey squirrel lives in a nest (called a drey) in trees, and in autumn when the leaves are thinner, these dreys are easily seen. It is often said that grey squirrels hibernate. They do not: on very cold or very wet days they may stay in their dreys, but no more than that.

But, in addition to the dormouse, fourteen of our mammals and all our reptiles hibernate. Of the fourteen mammals, twelve are bats, and they have all retired by the middle of October, though one, the pipistrelle, is not a very sound sleeper and comes out on most warm days. The other two, the badger and the hedgehog, are rather intermittent hibernators. The badger lives in a sett, sometimes as much as twelve feet below the ground, and comes out on most warm nights, but being exclusively nocturnal it is rarely seen. The hedgehog makes itself a nest in a bank or some similar place and sleeps fitfully—apparently coming out on the coldest nights!—until the beginning of February, when it settles down to sleep hard until the middle of April. Normally nocturnal, in autumn the hedgehog is frequently to be seen in broad daylight.

All the reptiles—the three snakes, the grass, the smooth and the adder, and three lizards, the common, the sand, and the slow-worm—hibernate very thoroughly from October until April, and sometimes some of them have retired as early as the first week in September.

The Breeding Season

None of our other animals hibernates. Rabbits and hares have no fixed breeding season (though hares show a marked preference for March and April) and as both have several litters in a year young rabbits and leverets may be found in any month. This is true, though in lesser degree, of the weasels—the common

HARVEST MICE. *Though not the smallest of our British mammals these little creatures are by far the most charming.*



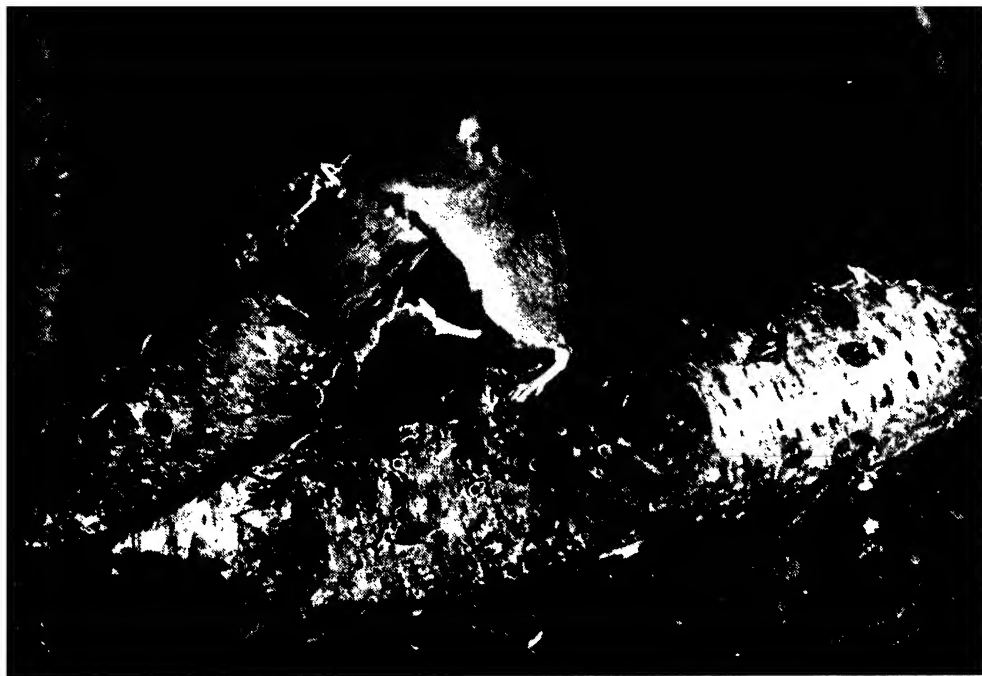


NAWAB SALAF JUNG SHAHJAHAN

BABY GREY SQUIRREL. *This species was introduced from North America some time ago, and was at first considered an attractive addition to our fauna. When full grown it is considerably larger and stronger than the red squirrel.*

RED SQUIRREL. *This delightful little animal was originally the only squirrel we had in the British Isles. It is now unfortunately very scarce and in many parts of the country has been exterminated or driven away by the grey squirrel.*





WOOD OR LONG-TAILED FIELD MOUSE. *Common in many parts of England, this tiny rodent shelters in barns and outhouses during winter. Its coat is of a bright reddish-grey colour, while the abdomen is white.*

weasel, the stoat, the marten and the polecat—and of the otter. The weasels all have more than one litter in the year, and the second and third may come as late as early October, while the otter, though having only one litter in the year, may have it in any month. But in general, the spring may be said to be the breeding season for these animals as it is for the fox, which has only one litter in the year, and the wildcat which may have more than one. So as a general rule there are more rabbits, hares, weasels and foxes to be seen in the autumn than at any other time of the year. The marten, the polecat and the wild cat are very rare and restricted to certain limited localities, but the others occur almost everywhere. During the winter the numbers are reduced again by various agencies. In the case of the rabbit these are mainly disease, and the attacks of the fox and

stoat and man. In the case of the fox and the stoat, man is the chief agency of destruction. But despite the very heavy loss of life among rabbits the total population steadily increases, so freely and so quickly does the rabbit breed.

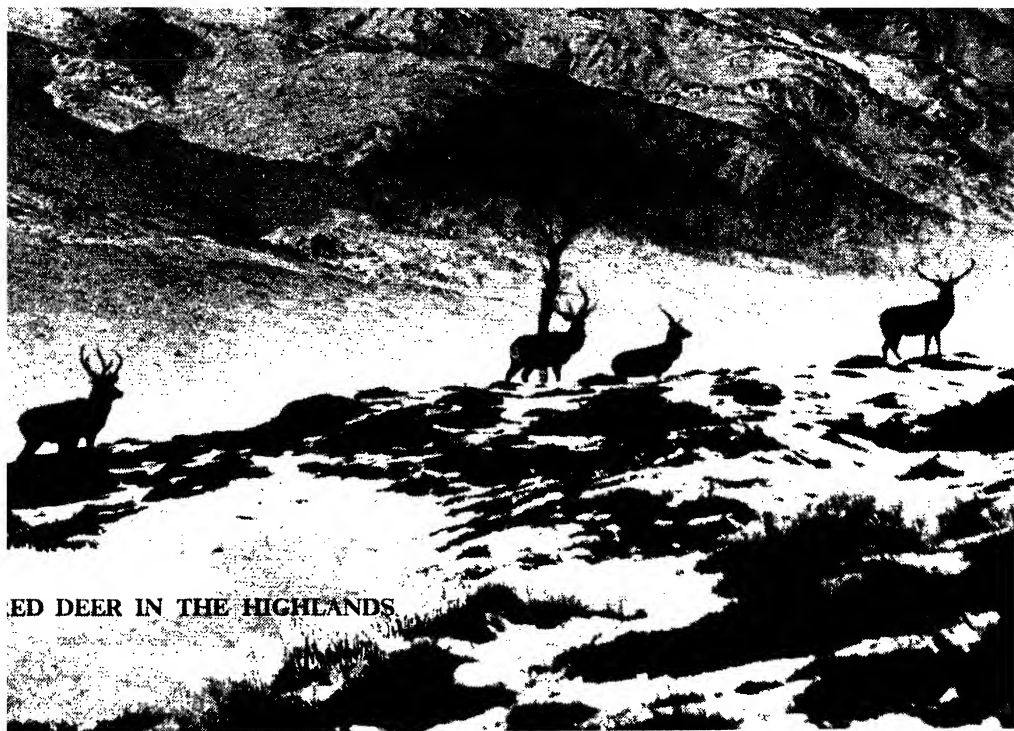
Autumn Breeding

Apart from those animals already mentioned bats and deer alone among British animals breed in the autumn. The breeding season among all our bats is at the end of September, but the single young one is not born until the following June. Bats do not breed until they are two years old. It is the same with the deer. There are three kinds of deer in this country—the red, the fallow, and the roe (in addition, a fourth, the japanese deer, is now at large in many districts)—and they all mate in the autumn, the red and the fallow in October and the roe from



THE COMMON OTTER *is a shy animal, though very rapacious when hunting, for it destroys far more creatures than it can possibly devour. Nocturnal in habit the otter makes its burrow on the river bank often among the roots of waterside trees.*





ED DEER IN THE HIGHLANDS

late June onwards into September. The young (calves in the case of red deer, fawns in the case of fallow or roe) are born in May or June of the following year.

Deer are generally regarded as uncommon in England, and it is true that the red deer is restricted to certain districts and elsewhere occurs only in parks. But the fallow deer and the roe are common in the woods of southern England, though they are nocturnal and rarely seen; the red is less addicted to woodlands and in those districts in which it still occurs in a wild state, as for example in Scotland or on Exmoor, is frequently seen. In the mating ("rutting") season the stags make themselves known by "roaring", a bellow whose sound carries a very long way. In the autumn the stags of all our deer become savage and it is advisable not to approach them closely. Even the "harmless" little roebuck has





done fatal injury to man before now.

So it is, throughout the winter; there is plenty of animal life about, but in the main it is resting. Easier to see than at any other time of the year, owing to the lack of foliage and to the soft condition of the ground which makes track-marks easy to follow, it yet needs a good deal of looking for. But whereas during spring and summer animal life is at its most active during the early morning and late evening (times which are not popular for outdoor entertainment with the majority of humans) in winter the middle of the day is the most active period with all animals except the fox, whose nocturnal raiding has largely been brought about by the aggressive attentions of human beings.

There is no opening date for spring. Spring in the British Isles comes by fits and starts, and a beautiful spring day may turn up at any time after the 1st January.

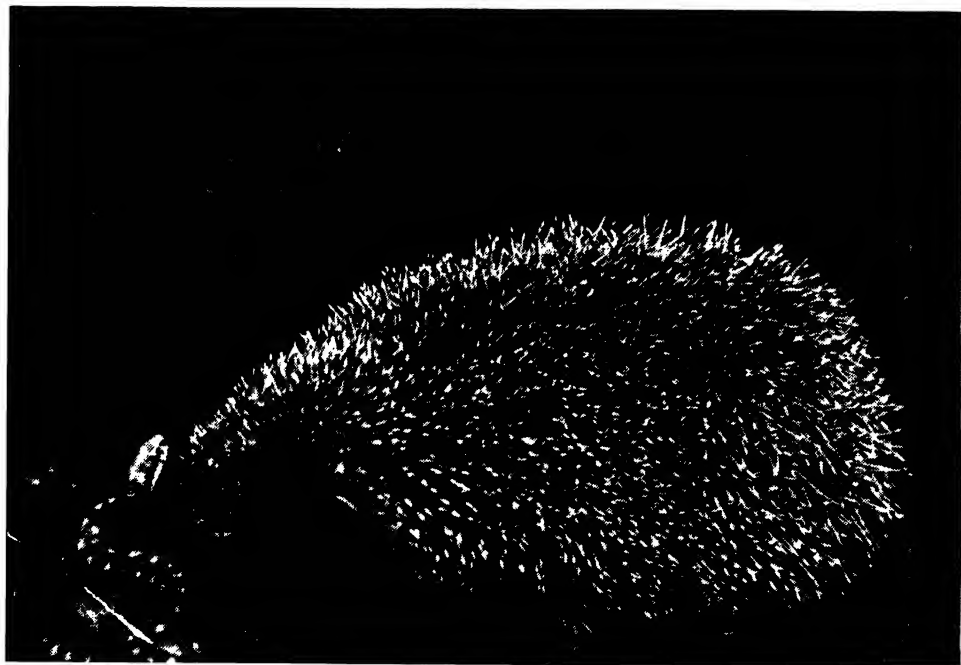


RED DEER



A PAIR OF BADGERS AT THEIR BURROW. *Not infrequently several badgers will make their burrows close together, sometimes they take up their quarters in a disused fox-earth. Although of the weasel tribe the badger is comparatively slow and ungainly.*

HEDGEHOG ATTACKING A VIPER. *The viper is defenceless against the attack of a hedgehog, for the animal seizes the snake by its tail and then curls up exposing a ball of prickles to the lashing head of the viper, which eventually dies fighting.*



But, generally speaking, from the middle of February there is a pronounced increase in the activity of our animal population. The sun is increasing in strength, frost is leaving the ground, and the mating season is drawing near. Those animals that have not hibernated are noticeably busier and sprightly towards the end of February, and those that have hibernated, with the exception of some of the bats, the hedgehog and the dormouse, are beginning to wake up. Towards the end of February, a grass snake or two may be found in sunny

spots and there will be a few bats hawking around the tree tops. But it is in March that the sleeper awakes. Snakes will be basking in the warmth of the spring sunshine, bats will be out fly-hunting of an evening, the badger will be indulging in his annual spring-clean.

The badger is a superlatively clean animal and all his winter bedding is removed and fresh brought in in preparation for the coming family. The best sign that a sett is occupied is the condition of the pathways leading to it. These become hard and flat from much

A YOUNG FOX. *When the fox is fully grown he is about two feet in length not counting the tail, and about twelve inches in height. His diet is omnivorous and unfortunately includes a voracious taste in poultry and other game.*









HARE IN ITS FORM

usage, so much so that unless it is wet the tracks of the badger do not show (this is never the case with the fox) but when the track does show, the imprint of all five toes is visible, for the badger is flat-footed. Another sign that badgers are in a wood is the claw-marks on the tree-trunks. These are not necessarily always to be found near a sett, as is so often said—they may be anywhere in the wood—but they are made only by badgers.

In March, too, the hares go "mad". Naturally very timid, at this season, the males indulge in competitive sports, running, jumping and boxing, the prize being the female. But the female before she is won also does a little fighting and as her kick is exceptionally powerful most male hares lose a certain amount of fur before they can success-

fully claim their mate. These fights between hares are rarely fatal, though a certain amount of damage is done, but the "gentle" rabbit is a very fierce fighter in spring and contests between bucks do end in death for the loser on occasions, perhaps more frequently than is generally realized. The rabbit fights by ripping its hind legs downwards, a disembowelling action that can be deadly. In a fight between bucks it is the one on top that is in the weakest position.

By early April the woods are filled with foolish young rabbits, and the weasel, the stoat, the fox and the stray cat find life easy. The squirrel is busy re-building, or at least re-lining his drey; the water-vole is building his platform of reeds; the mice are busy in their holes and the rats in theirs, and the weasel, who likes mice and rats equally with young

STOAT AND ITS PREY. *The stoat is a very cunning, quick and voracious mammal and is here seen with a rat victim. Having made his kill with a single death wound, the undamaged body is carried back to the stoat's already well stocked larder.*



*Mother Fox settles down
proudly to suckle her
latest litter of cubs.*

The Life of a FOX



*While the new family finds its
feet, the vixen brings them
some tit-bits.*



*A game of hide-and-seek passes
the time pleasantly
for the cubs.*



*When the cubs are old enough
to hunt the sharpest catches*



8 Pursued by hounds, he paddles in the brook to destroy the scent.

9 Now fully grown, he makes fifteen with a young vixen and off they go.

6 Emboldened by success he leaps the farmyard fence and snatches a fat hen.

7 Now a confirmed poacher, he makes constant raids on man's preserve.

A FAMILY OF PIPISTRELLE BATS. *The most common bat of the British Isles, this rodent hides in dark recesses in daytime.*

rabbits, is busy indeed. All these things, of course, can be seen by the observant, but usually it is the ear and not the eye that first picks up the signs of animal life. For in spring there are the alarm notes of the birds to give away the presence of a weasel, and the terrified squeal of a rabbit is often the first clue to the proximity of a stoat.

Young Families.

With the coming of May bats are on the wing, often in very large numbers, every evening. A bat is just a bat, irrespective of species to the majority of people, but actually each species flies in its own way and has its own peculiar habits and calls, and with a little practice it is not so very difficult to tell one sort from another.

Many, indeed most, of our animals—bats and deer excepted—have young by this time. Both the water-vole and the water-shrew either have young or may be seen carrying bedding to their nests. Stoats and weasels may be found in a ditch or by a bank or a wall carrying a young one—kitten-fashion—for both these animals seem to have a habit of moving their children from time to time. Young rabbits are everywhere, young squirrels dash round tree trunks as agilely and expertly as their parents, a nest of young rats—pink, blind and helpless—may be found on occasions in most exposed places. Fox cubs may be about (for cubs are sometimes born as early as January in Hampshire) and there is no more pleasant sight in nature than cubs a month or so old playing like kittens (the fox though dog-like in appearance and in many habits, is cat-like in play). Baby foxes, by the way, are grey rather than brown and the



reddish-yellow fur does not appear until September.

Our snakes too, are more active—if it is a warm season they are fully active—and the adder is a menace to such ground-nesting birds as the willow wren, devouring the helpless nestlings one after another in any nest it comes across,



and then finding some nice warm stone on which to lie and sleep off its meal. In June—Midsummer's Day is a good average date—the bats produce their single young, a blind and helpless creature, which is carried around by its mother for the first ten days or so even on hunting flights. After that it gets too

heavy and is left hanging head downwards in the den while the parent (male bats have nothing to do with the care of the young) goes hunting.

In June, usually in the first week, the roe deer fawns are dropped in the thickest cover the females can find. The fawn, a white-spotted little thing,





can follow its mother in about a fortnight, but until then lies still in its bed in cover. Red deer calves, also white-spotted and born about the same time, are quite helpless for a week or so after birth and cannot even stand. The hinds hide them in the thickest cover available and leave them, returning only at intervals to suckle them. The fallow deer fawn, on the other hand, can run briskly within a few hours of birth and is remarkably capable, and a very agile creature at two days old. It is possible to stand and look down upon a newly-born red deer calf or roe deer fawn; but it is very difficult to get anywhere near a fallow deer fawn.

In July most of these families of youngsters are well enough grown and in many cases there are other younger families also on the way. There are always families of young stoats abroad, well-grown and sturdy, playing like kittens and hunting like dogs or wolves. They are graceful creatures, but completely ruthless in their hunting and with a lust for killing that is equalled only by the fox among British animals. The stoat is a wily hunter too, and is said to hypnotize its victims by turning somersaults and so on in front of them. Certainly a rabbit hunted by a stoat seems to be hypnotized and will sometimes sit down and wait for death, squealing piteously the while. One's sympathy goes out to the rabbit, but in point of fact, the gentle rabbit does a great deal more harm to crops and gardens than the bloodthirsty stoat.

Snakes and Lizards

Among the common sights of the countryside in August and September are young reptiles. It is in August that the reptiles produce their young. Of the smaller snakes the adder is usually the earliest. The adder is viviparous—that is the young are born alive—and it has

from five to twenty young at birth, the number apparently increasing with the size of the mother, though numbers in excess of twelve are uncommon. The young adders are exactly like the adults, but only about four inches long, and equipped with poison fangs at birth. Their first concern in life is to put as much distance as possible between themselves and their mother, for she is usually very hungry and not at all above eating her children. The grass snake lays her eggs—varying in number between twelve and fifty according to the size of the female—in manure heaps, mounds of rotting leaves and so on, and leaves them to hatch on their own account. The process takes about 6 weeks and the young snakes are about 6 inches long at birth. Many females will lay in the same heap, and over 1,000 eggs have been found together. The smooth snake's eggs hatch the moment they leave the body. This snake lays fewer eggs (rarely more than 10 and frequently only 2 or 3) and the young are quite large at birth, from 7 to 8½ inches long. Like all other snakes they are very well able to look after themselves immediately.

The lizards follow just the same course; one is viviparous, the sand lizard leaves her eggs to hatch, and in the common lizard the eggs hatch as they are laid. The slow-worm lays from 7 to 20 eggs, and the young (lovely silver-white creatures with 3 black lines on top and black stomachs) are about 3 inches long. The young of sand lizards (usually 5 to 8 eggs are laid) are tiny little brown creatures very little more than 2½ inches long including the tail, but that is bigger than the young of the common lizard, which rarely measures more than 1½ inches. Like the snakes, the lizards are self-supporting from birth and the mother pays no attention to them at all.

In late August, too, there are many more bats on the wing. These are mainly

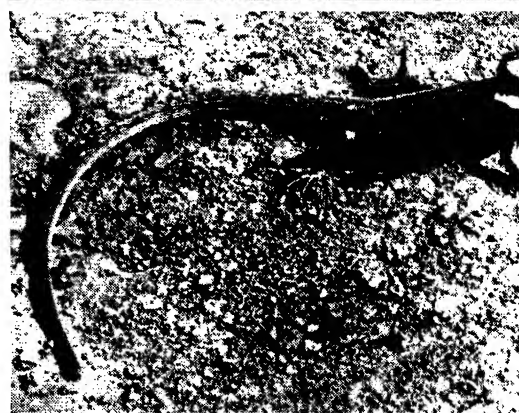
FOUR COMMON REPTILES. *In these pictures may be seen the most familiar reptiles to be found in the British Isles. The land lizard in the top photograph is a sandy brown shade with a whitish under-surface. The slow-worm or legless lizard is shown in the next picture tying itself into knots. The green lizard is a lovely olive-green in colour with a yellow shirtfront. The viper or adder as it is commonly called has blackish markings down the back and a V-shaped black marking on the head (see lowest picture).*

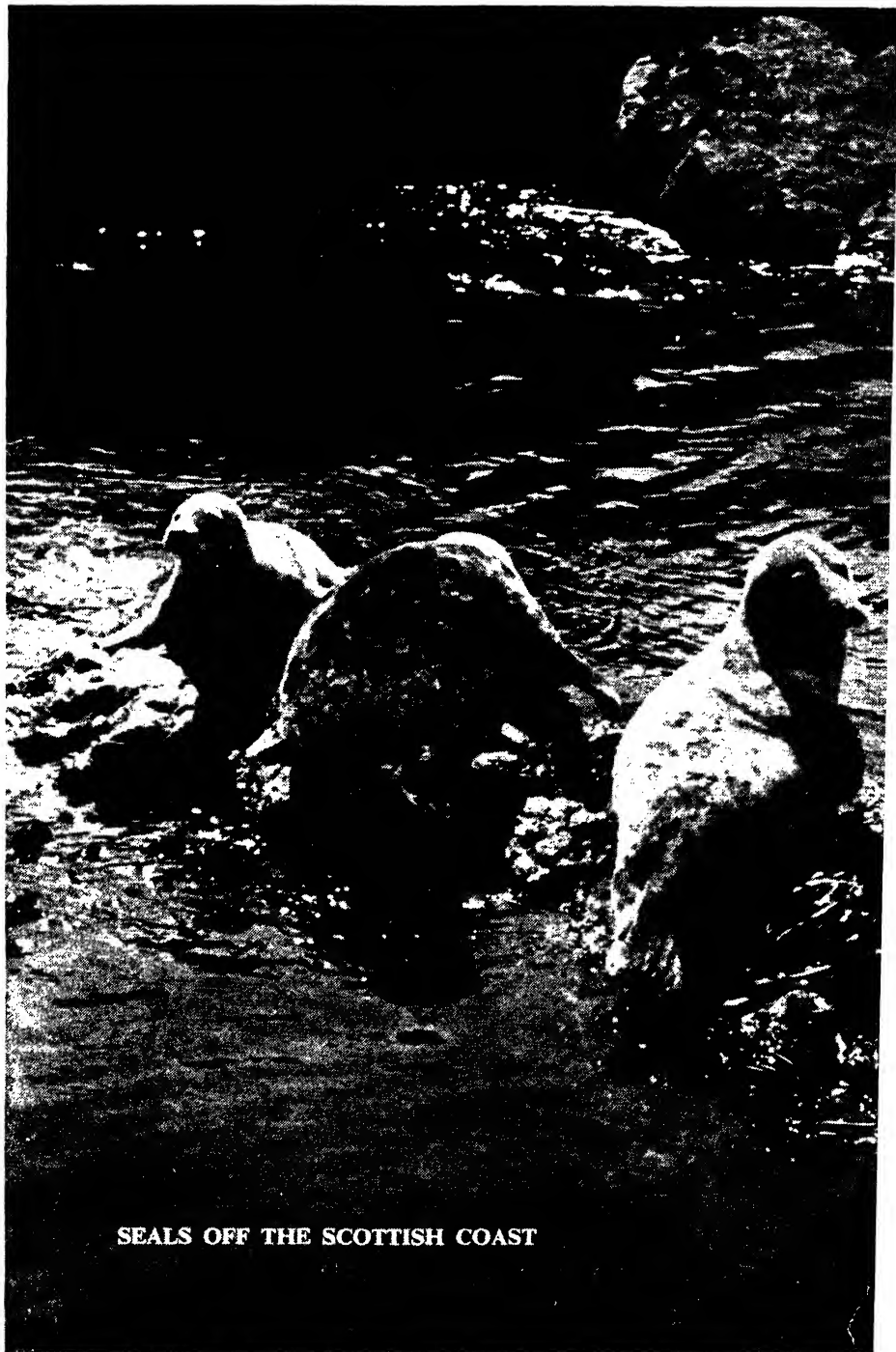
the young who have just begun to fly, but it is also possible that there are some visitors from the Continent, for many of the bats are quite capable of flying the Channel. Everyone has seen young birds being taught to fly. No one has ever seen a young bat being taught. Apparently they fly instinctively, and certainly young bats are just as expert on the wing as adults. But in their first year they do not have much flying practice, for few begin to fly before the third week in August and most have sought their winter quarters for the long sleep of hibernation by the end of the first week in October.

Varieties of British Birds

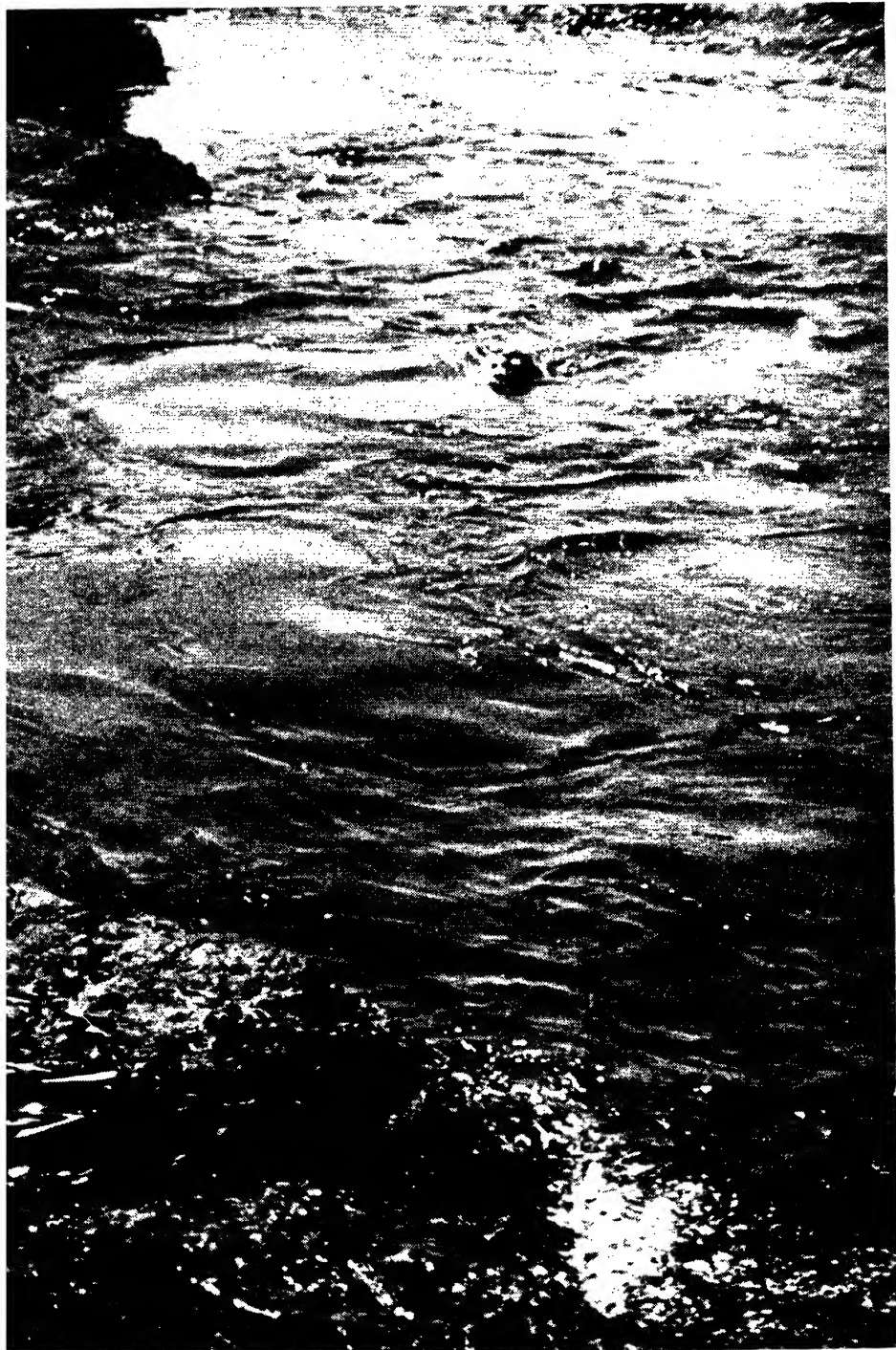
Altogether, there are 424 species of birds on the British list. Of this number, 187 are so rare and infrequent in their visits (26 have been recorded only once) that they can safely be disregarded in any general account of British birds. But that still leaves 237 species and it would not be possible to mention each kind, no matter how briefly.

Roughly, these 237 varieties may be divided into residents, summer residents, summer visitors, winter visitors, and passage migrants. The residents are those birds which actually breed in the British Isles and also spend the winter there and they are 123 in number. Those birds





SEALS OFF THE SCOTTISH COAST





WILD DUCK OR MALLARD. *The best example of our freshwater non-diving ducks the mallard is perhaps the handsomest of its tribe. Practically all our domestic ducks are descended from this species, one notable exception being the famous Aylesburys.*

may be classed in the summer resident group which come to the British Isles to breed but spend the winter abroad and they number 52. Summer visitors comprise the birds, which, having already bred during the southern summer, come to this country to spend the summer but do not breed here and they number only 2. The term "winter visitors" may be applied to those birds which, having already bred in the far north, come south to spend the winter in the British Isles and there are 27 of this species.

Finally, the passage migrants are those birds which visit us and remain for a short time while on their journey to and from breeding grounds and winter quarters, and they number 23.

These are only rough divisions—there is a certain amount of overlap between most of them, and particularly between the last two—but they are quite

good enough for all practical purposes.

The autumn, as far as birds are concerned, is very definitely the beginning of the year. Our residents have finished nesting and completed the moult, and are beginning the long preparation for the final hurried months of the year, the crowded three or four months in which mates must be found and young hatched and reared. Our summer residents have also finished nesting and completed the moult and have either left for their winter quarters (for some do so in August) or are preparing to depart. Our two summer visitors leave us to enjoy their real summer, for our summer is their winter, and the winter visitors and passage migrants, having finished their nesting and completed their moult, begin to arrive on our shores. The opening months of autumn and the opening months of spring, are the busy



SPARROWS IN WINTER



VAB SALAR JUNG BAHADUR

THE SWALLOW BUILDS HER NEST. *One of our best-known and loved summer visitors, the swallow is easily recognized by the blue sheen on wings and back, and the long forked tail. Close inspection shows throat and forehead chestnut and chest pink.*

season for birds so far as the British Isles are concerned. In those four months—September and October and March and April—there are more species within our boundaries than at any other time of the year, for at these times there is a great coming and going.

It is not easy to note the departure of birds. Many birds do not sing after June, and with the autumn they slip silently away and are gone without our missing them. We note that they have gone, and a day or two later they are as plentiful as ever. The explanation is simple. Our local birds have gone and their places have been taken by others from farther north, travellers stopping for a rest. The most noticeable, inland at any rate, are the swallows and martins. The birds line up on telegraph poles, twittering and taking short practice flights, and almost force themselves upon

the notice of the most unobservant. They may be seen one day, perhaps two days in succession, and then they are gone. A day or two later and there will be more.

We may watch this migratory movement from the middle of September right into October, and we know that some of the birds are going as far as South Africa. The rest of the exodus is not easy to spot and most of it is never really seen. The chiffchaff turns up in gardens, where it is not known normally, and draws attention to itself by its simple song, and sometimes during the opening days of the partridge shooting season a corncrake meets its death, but the vast majority of the birds depart unseen. Red-backed shrike and spotted flycatcher, grasshopper warbler and nightjar—who has seen these birds (and many others) set out on their long journey?

It would be a mistake, however, to suppose that the bird population of the British Isles shrinks with the departure of our summer residents. It is widely supposed that we have more birds in summer than in winter. Certainly, we do have more species; 187 as against 182. But we do not have more birds. In point of fact, our winter bird population must be considerably in excess of our summer, for this reason; nesting sites and the supply of food for nestlings must be limited in an area the size of the British Isles and this controls the number of birds nesting with us, but these considerations do not apply in winter. The birds have then only to find food for themselves, and it is noticeable that the majority of our winter visitors and passage migrants are water-birds, and there is plenty of water in and around the British Isles.

Winter Visitors

These winter visitors begin to arrive before emigration ends. Diving ducks and shovellers in large numbers, packs of mallard, teal and widgeon, flocks of tufted ducks and pochards, and by the end of September the vanguard of the huge hordes of waders has reached our northern and eastern coasts. Inland the numbers of lapwings have increased enormously, for many foreigners have arrived to join our home-bred birds, and these now fly in large flocks over the farmlands. There are flocks of golden plover too, home-bred and foreign, and there are the beginnings of the enormous congregations of starlings, indulging evening after evening in mass flights—carried out with the precision of guardsmen on parade.

In October the life of inland birds receives an additional spurt, and there are again calls and songs. Redwings are coming in, and field-fares, with loud *chacking* voices are about in the more

open spaces. Jays are noisy in the woods throughout the day, and tawny owls hoot at night. The hedge-sparrow (more properly the duncock) pipes as it fusses about the hedgerows, the song thrush is beginning to sing again, and blackbirds (very silent in autumn except for their frantic alarm note) are busy wherever there are berries. There may be crossbills in the larches, too, but the crossbill is seen less often than his handiwork, in the shape of falling or fallen cones. It is easy to tell the difference between the work of the squirrel and the crossbill, for the former nibbles off the scales while the latter leaves them on.

As autumn advances, the birds tend to gather more and more into flocks. The mixed flocks of finches, tits and sparrows flitting along the hedgerows by the wayside or chittering around the farmstacks are familiar. In all these flocks, but especially in beech country, there will be some bramblings, visitors from Scandinavia, and they may be recognized as they fly away by their pale lower backs. Rooks and jackdaws gather together at great communal roosts. Rooks will sometimes fly many miles of an evening back to the roost, the flocks passing over in irregular flapping flight and cawing loudly just before the sun sets, and some of the roosts sometimes contain thousands of birds.

These winter roosts are quite different from the rookeries, which are deserted in winter. But it takes more than mere wintry weather to destroy a rook's nest and on many winter mornings birds return to the rookery and sit about cawing at each other. Magpies also assemble in flocks during the winter to roost, though during the daytime they are much more individual in habit—preferring to associate with rooks and other birds of their own kind rather than with their own exclusively. The lapwings gather for communal flight as

the dusk falls, and huge flocks of wood-pigeons come flying in to roost.

The small birds also roost communally; sparrows, finches and tits in mixed flocks, small parties of wrens together, starlings in uncountable multitudes, pheasants flying up at dusk with loud clamour, even blackbirds.

Snipe rise calling from the marsh, the redshank always loud of voice is just a little louder, thrushes, redwings, field-fares, hedge-sparrows, robins, all have their evening spell of song or twittering. And thrushes, larks, robins and great tits sing fairly fully save in the coldest weather, while the tawny owl haunts even the frostiest night with weird music. But the best places for birds in winter are undoubtedly the lakes and large ponds, the marshes and the sea-shore.

It is cold work watching by water in winter, damp and cold and often fog-

bound, but very well worth while, for if fog and mist make it difficult for us to see the birds it makes it just as difficult for the birds to see us, and close approach is often possible. Furthermore the rarities and the very shy come to our waters in winter. On the big lakes and ponds there is the goosander, diving for fish: there are pintail, mallard, teal, wigeon, tufted duck, pochard. There may be some such exciting duck as drake smew: there will almost certainly be goldeneyes. And on the shores of marsh and mere, by pond-side, even by streamside, there will be a snipe, a sandpiper or two, redshank and perhaps some other waders, the peaceful greenshank or the shy sandpiper, and in all probability a heron, motionless, apparently lost in thought, but with great dagger beak ready for action.

These inland sheets of water carry a far larger population in winter than in

GREAT CRESTED GREBE STANDING ON HER NEST. *The nest is placed among reeds and rushes and the four eggs are white. As soon as the young are hatched they are able to swim and dive, and therefore need little care from the mother bird.*





RED THROATED DIVER. *This beautiful bird is not frequently to be found in the British Isles, being only an occasional visitor. The nest consists of only a little flattened herbage near water. The eggs are olive-brown spotted with darker brown.*

summer. A lake that in spring may carry a dozen pair of mallard and a dozen pair of coot may carry 200 of each species in winter, and in addition there will be large flocks of teal, tufted duck, pochard, wigeon and so forth. A lake with a spring population of 20 birds may easily support a winter population of two or three thousand.

But these birds are constantly moving on. Our winter bird population, whether of the land or water kind, is essentially a mobile population. The birds follow the food supply. So in November the mixed finch flocks are among the beech trees searching for mast. Later, when frost has made the fields an unprofitable hunting ground, finches and sparrow buntings and tits with a robin or two hanging about the outskirts visit the stackyards in search for grain amongst the trodden chaff and mud.

The tree-creeper and the nuthatch work the tree trunks systematically and journey far in winter, sometimes in company with mixed flocks of finches, frequently alone. Some birds—usually the more sedentary ones—are solitary feeders. The wren, the meadow-pipit, the pied wagtail and the blackbird rarely feed in company, although in winter they are never very far from their kind. These solitary feeders have not, obviously, so much need to move. The flock quickly denudes an area of food and must move. So as soon as the alder catkins appear, so soon as the first flowers of the birch come out, the siskins and the redpolls seem to feed not only on them but on the old cones of last season. Buds appear on many plants in February, and if other food is at all short they disappear as quickly, and the early buds of fruit bushes are eagerly sought and



BLACKBIRD



YOUNG THRUSH







TAWNY OWL WITH YOUNG. *The largest of our British owls the tawny owl nest in old trees not only in woods and forests but quite frequently in urban districts. Owing to its nocturnal habits and dusky plumage, it is more often heard than seen.*

have a short life if bullfinches are about.

Towards the end of February, many of our winter visitors are preparing to depart. There is a general movement northwards but the movement is so unhurried as yet and the places of the departed so quickly filled from farther south that it is scarcely noticeable. But this is *the* time of the year by the water-side, for all sorts of strange birds turn up in places which they do not otherwise frequent to reward the observer for his patience—ducks, geese, divers, grebes, waders (even perhaps the greatest rarity for the ordinary observer, a spoonbill, say, or an avocet) and there is no telling from day to day what the patient man may not see. But none of the birds is easy to approach; indeed they are more wary now than at any time of the year. For they have probably been shot at more than once (this is particularly true of the ducks and the geese) and the birds that came south in the autumn, innocent of the ways of men, return north in the spring very much wiser.

Courting

By tradition St. Valentine's Day has been fixed as the day on which the birds pair. It is not an absolute date; perhaps it is not even a fairly representative date, for in an open winter the sexual urge in many of our resident species is as early as December. By the middle of February many of the winter flocks have broken up and song, which is the prelude to courtship, has increased vastly. Larks chase one another, the extraordinary tumbling flight of the lapwing commences, pheasants crow, the partridge chases those who would seduce his partner, the starling struts and whistles, blue-tits fight with shrill cries and raised crests, the blackbird attacks all those who come into his part of the garden, and magpies jump from branch to branch showing off their beautiful plumage.

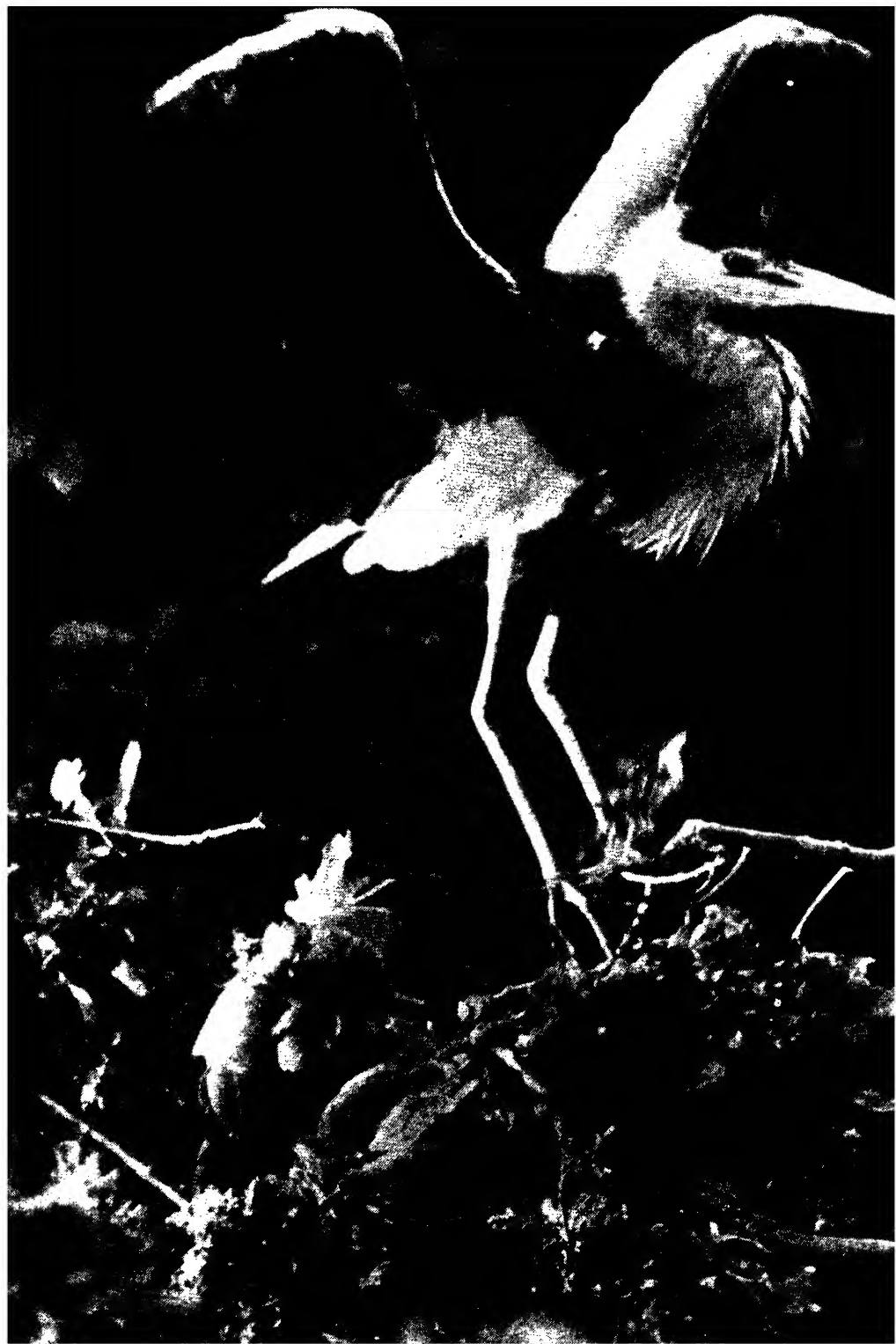
Most of the birds begin to sing properly.

February is a little early for nest building, but by the end of the month, the rooks will have repaired the damage done to the nests by the gales of winter, the jackdaws will be piling a few more sticks on to last year's pile (for that matter the pile may be many years old), the heron will be back at the heronry. In a mild February, after a mild winter, rooks, jackdaws, crows, herons and missel-thrushes may have eggs, though young in February are exceptional. Nesting, like everything else in the life of a bird, is governed by the food supply. The sexual urge may be awakened by the mild weather, but young are not produced unless there is food available for their needs.

Pairing

From early March onwards, there is food, though not in abundance, and most of our resident birds are nesting. Lapwing and partridge in the open fields are in the full flood of courtship. The hedge-sparrow flits from branch to branch, bush to bush, piping incessantly and singing its sweet, subdued music even at night—it is about the earliest of night-singing birds—and house-sparrows carry on noisy courtships that are half battle in the hedgerows and in the thick ivy on the housewalls. Chaffinch and yellow-hammer sing incessantly, the former from some conveniently placed tree, the latter from some favoured spot in a hedge top. But the nest discovered first is usually the bulky structure of the song-thrush built in some bare hedge or tree long before there is sufficient cover. Though both missel-thrush and blackbird may lay long before the song-thrush, the latter is probably the earliest consistent nester among our birds with the tawny owl a close second.

But all these birds will have started before the first swallow, probably before







GRASSHOPPER-WARBLER FEEDING YOUNG. *This inconspicuous summer visito with olive-brown plumage has a more mottled appearance than other warblers. Sh builds her nest of dried grass and moss in tufts of long grass or reeds.*

the first chiffchaff appears. The first migrants are not usually classed as summer residents, for they are a species which both stay here and go abroad—pied wagtails, meadow-pipits and so forth—and they are followed by the warblers. These come at a time when the nicest food is on the market, as it were, and they help the resident finches, the flocks of bramblings and mealy redpolls on their way north, to keep down what could easily become an insect plague.

Early Migrants

Unless the weather is unusually mild and warm the first true immigrants do not come in, as a general rule, until the very end of March, although a few wheatears and chiffchaffs are on the south coast a week or two earlier and an odd ring-ousel or so may be seen making its way

through the wilder places to the hills. Chiffchaffs, sandmartins and swallows are well distributed before the end of the month, and wheatears are arriving in steadily increasing numbers. But the rush does not really begin until April, and then the birds come in so fast that the ornithologist has neither the time nor the physical ability to take note of them. The countryside is transformed within the space of a week and from now on until the end of June, no day is long enough for the keen observer.

Swifts join swallows in the mad chase for flying insects. The cuckoo—usually reported before its first arrival—pours its twin note, sweet but monotonous, from the tree tops. Willow wren, garden warbler, blackcap join the chiffchaff, the chaffinch and the thrush in the woodland chorus. There are whitethroats in the

YOUNG CUCKOO. *Although this bird is a welcome vocal messenger of spring, its young start out by viciously ejecting the rightful occupants of the nest where the mother cuckoo has trespassed to lay the eggs she does not intend to hatch.*





A WOOD PIGEON AND FAMILY. *This bird is easily recognized by the white patch on either side of the neck and the white edges to its wings. In the country the wood pigeon is usually very timid but seems to gain confidence when it finds its way into the towns.*

lanes and nightingales in the spinneys. The turtle-dove purrs and the nightjar churrs. The spotted flycatcher springs from the fence to take some passing midge. The wood pigeon calls lazily from the woods and soars with a loud clap of wings over some glade. The countryside is filled again with birds and bird song. So much so, in fact, that few notice the departure of our winter visitors.

In the midst of bird song and birds' nesting, we forget the fieldfare and the brambling, the siskins and the redpoll, and the thousands of ducks that rested upon the lakes and ponds. They do not go before the summer birds arrive: there is a very considerable overlap. The northern nesters move northwards slowly following the spring and the food

supply, and the last fieldfares leave our northern coasts long after the summer residents have settled down.

May, of course, is the great month for the bird lover as it is for those lesser bird lovers the egg-collectors, and the enthusiastic young birds'-nester. There is nothing wrong with egg-collecting provided that it is not allowed to become a form of kleptomania, and birds'-nesting is a most fascinating pursuit. But mere search of the trees and the hedgerows, mere quartering of the open ground (about 90 of our birds nest on the ground) is monotonous and very rarely profitable. It is much better to watch the male, to note his particular song-post, and so to mark down his nest, much better both from the point of view of finding the nest and from that

of training one's powers of observation.

Many of the birds have now, of course, got nestlings, little helpless creatures that are always hungry and always demanding attention. As they grow, so do the cares, labours, and worries of the parents, and it is no wonder to anyone who has watched a nest of youngsters, that the parents are worn and thin at the end of summer. The trials and labours of those birds that raise more than one brood in a year are truly immense. This applies particularly to the birds that build nests either on or off the ground and lay small or smallish eggs, for the birds which merely make a scrape and lay comparatively large eggs—the plovers, the grouse and so on—are relieved of most of the parental cares since the young are born so well developed that they can care for

themselves in no small measure within a few hours of birth.

This is also true of the ducks and the geese. Ducklings can swim almost from the moment they are born. So in passerine birds—with the exception of the cuckoo which discards all parental responsibility—both parents tend the young, but in the majority of ground-nesting birds and in the ducks and geese the male has nothing to do with the incubation of the eggs or the care of the young. In these birds the moult comes earlier in the male than the female.

With June there comes a notable diminution of song. Parental cares are too heavy. In July and August a great silence descends upon the woods. The robin is an exception but its occasional bursts of song, and the first amateur

A FAMILY OF JAYS. *These handsome birds with pinkish-brown plumage are much disliked by gamekeepers and farmers for they cause considerable havoc among pheasants and partridge nests and also have a keen appetite for peas, beans and fruit of all kinds.*





GREEN WOODPECKER. *This is perhaps our most beautiful bird, for the lovely green plumage is accentuated by its red crown and nape.*

efforts of a young thrush, only emphasize the general silence. This silence is due to the moult, a time at which all birds are remarkably depressed, and, in no small measure, to exhaustion. Moulting is in itself an exhausting business—and the great battle of rearing one or more broods of hungry nestlings has taken the spirit from the adults.

There is rather more song in the open country, but nothing like what there was in May and early June. Reed-buntings, yellowhammers and corn-buntings still sing, but the song is short-lived and rather lifeless. The moult in buntings does not have quite such a quelling effect, but it does affect song. The sedge-warbler no longer sings, unless forced to do so. A stone or a handful of mud slung into the reed-bed by day

or night will always bring forth an answering burst of song, short-lived and rather querulous but still song, should there be a sedge-warbler present. Towards the end of August a few species begin their autumn songs, rather subdued echoes of the glorious music of spring, but bird-song proper ends in July.

Towards the end of August autumnal flocking begins. The house sparrows leave the buildings for the harvest fields (no bird is more hated by the farmer, but the house sparrow is not the only one that does damage) and the starlings and lapwings are gathering together in little parties that will soon merge into huge flocks. The sand martins gather together also and a large gathering of these birds—a big reed bed is a favourite roosting place—is a most impressive sight. The birds come in at night in small parties until there is a flock of some thousands, and before they finally settle down, they fly in ordered mass, fast and intricate in manoeuvre. Soon they will leave, as the swifts have already left, for warmer lands farther south. The year has turned a full circle.

Sea-Birds and Predators

It will be noticed that no mention has been made of two large classes—the sea-birds and the predators—in this account. This is because they do not fall naturally into a seasonal description. But this must not be taken to mean that their lives are not in any way governed by the seasons: so far as mating and rearing young, and in certain cases migration, are concerned they follow the normal seasonal rules. But in the main their lives and habits are governed, to a much larger extent than is the case



SWANS AND THEIR YOUNG BROOD. *The mute swan is partly domesticated and a familiar inhabitant of most of our ponds, lakes and waterways; it can be distinguished from the truly wild swan by its deep orange bill with a black knob.*



THE LOVE GIFT. *Whilst blue-tits are nesting the cock bird flies off in search of food. He returns with a dainty morsel for his mate who flutters her appreciation.*

YOUNG STARLINGS DEMANDING FOOD. *Though as large as their parents young starlings can be easily distinguished by their brownish feathers. The adult bird has a glossy purple and green sheen on its plumage.*



BLACK-HEADED GULLS. *As with all other gulls the toes are webbed and the claws poorly developed. They have remarkably keen vision and a voracious appetite. In winter and spring they frequent inland cultivated tracts in search of food.*





YOUNG PEREGRINE FALCONS. *As in all groups of diurnal birds of prey, the female is larger than the male. She nests mostly on cliffs and lays either four or five eggs. The adult falcon preys upon such birds as pigeons, partridges and ducks.*

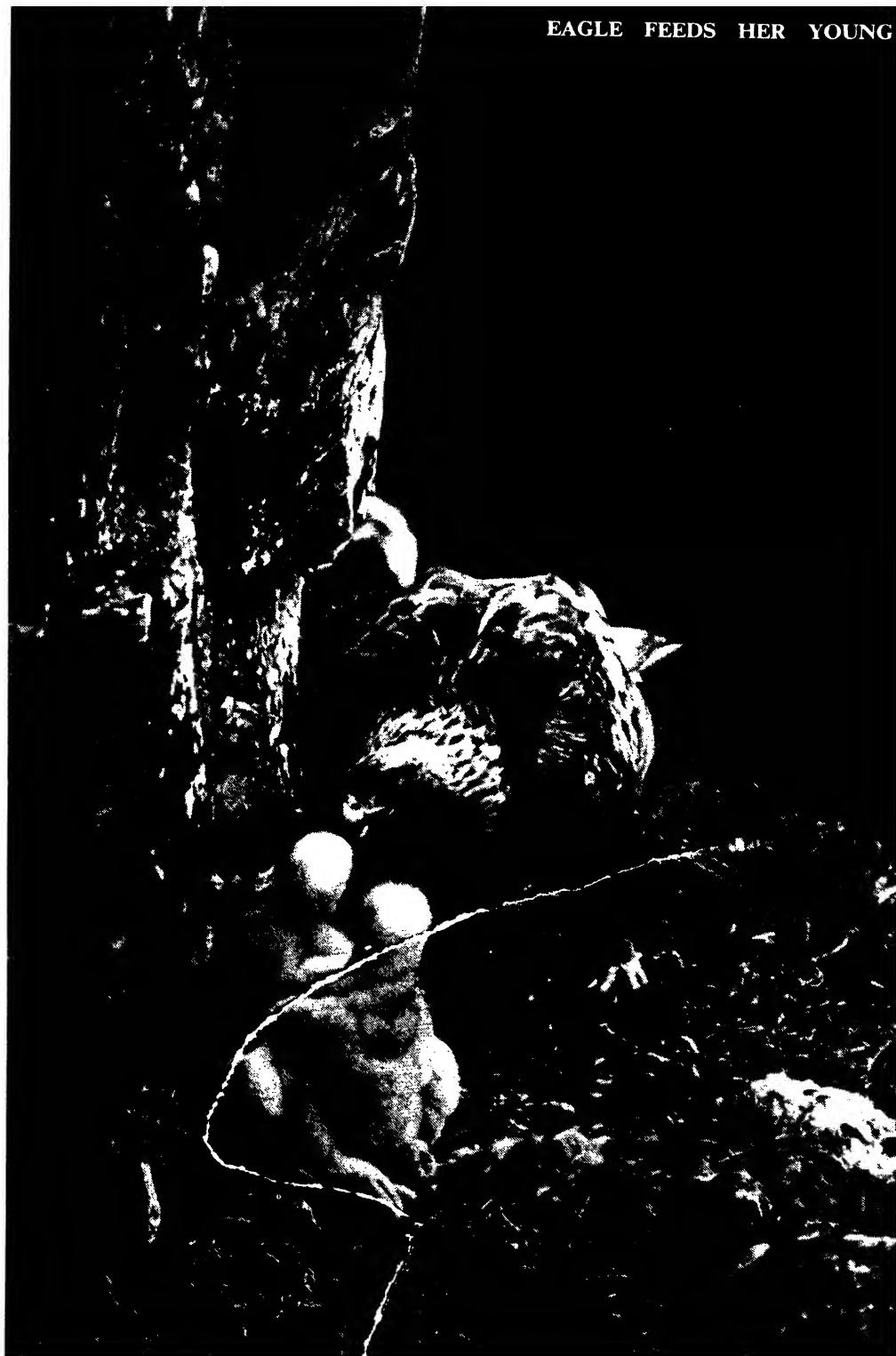
with other birds, by the lives and habits of other birds and animals, since it is these creatures which provide their main food supply. This is true of both sea-birds and predators, though at first sight it appears to be more true of the predators.

Let us, therefore, take the predators first. Predatory birds are those land birds that live upon other birds and upon animals. This is, of course, a very broad definition. It could be taken to include the red-backed shrike, the jay, the magpie, the rook, the raven, the crow, the heron—even the great tit—and many more. All these birds kill and eat, on occasion, other birds and small animals. But they are not usually included among the predatory birds. That is a term which is properly confined to the eagles, the osprey, the kite, the falcons, the hawks, the harriers, the buzzards and

the owls. We need not concern ourselves with the osprey or the kite. The former very rarely occurs in Great Britain now, and is invariably shot when it does appear, the latter is reduced to a sorry remnant, inbred and weak, perhaps a dozen in all, lingering on in Wales and very strictly protected. Of the eagles, only one—the magnificent golden eagle, the king of birds—remains with us. Fortunately the golden eagle, thanks to the protection offered by far-sighted Scottish landowners, is steadily increasing and may now be seen in majestic flight in many parts of the Highlands. It is a powerful bird, well able to kill a lamb or the calf of a red deer (gruesome, but exaggerated, stories are told of its carrying off babies), but it feeds chiefly on the blue or mountain hare.

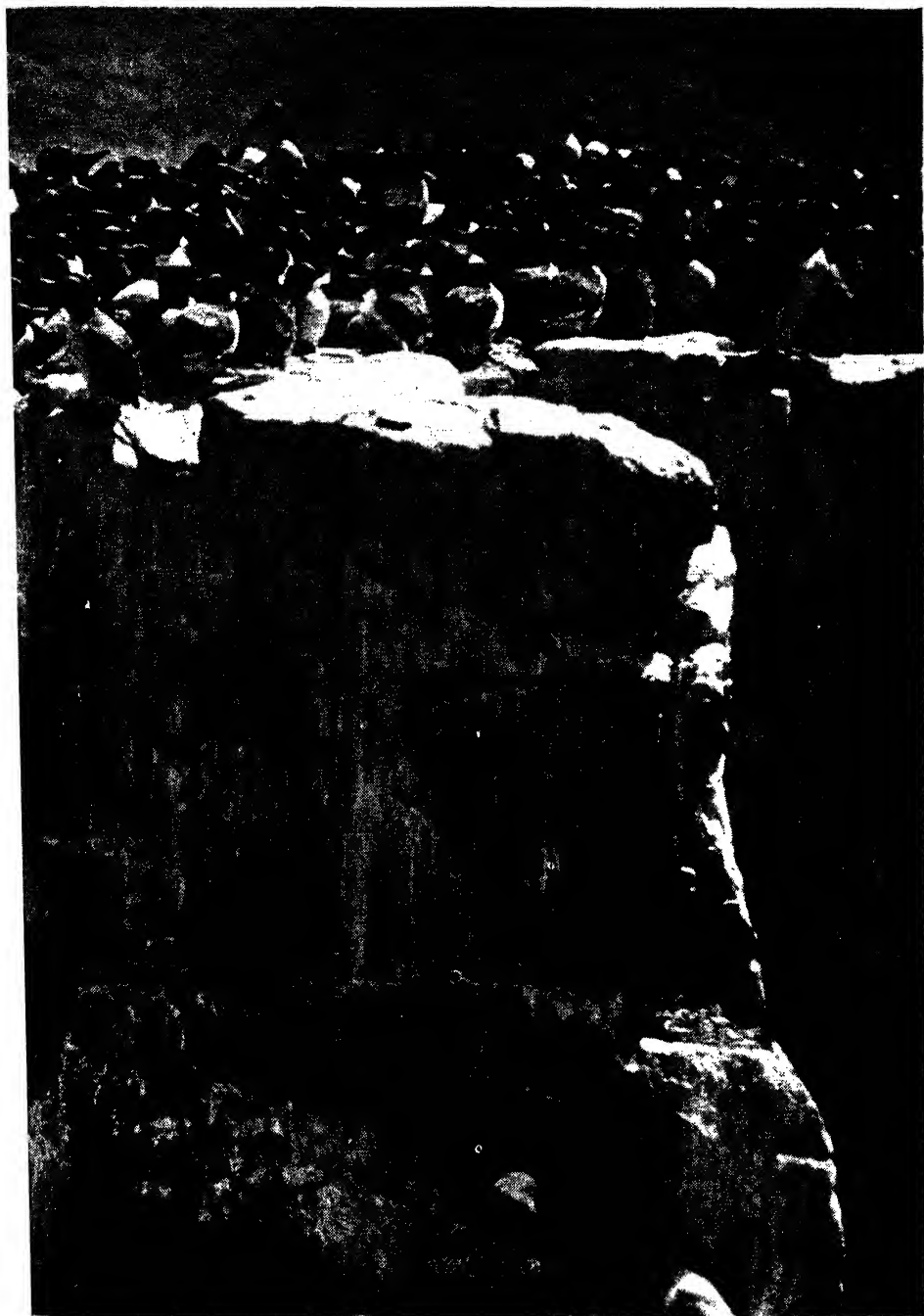
One rarely hears the word falcon in this country, frequently the word hawk

EAGLE FEEDS HER YOUNG





COMMON GUILLEMOTS. *This bird is known as the "foolish" guillemot because of its indifference to egg-gatherers. Like the gulls and plovers the guillemots are restricted to the wilder northern waters and they resort to lofty cliffs at many*



points round our coasts to lay their eggs on the bare rocks. Guillemots are about eighteen inches in length and the beak is long and pointed. The upper plumage is brownish-black except for the white-tipped secondaries; the under plumage is white.



Yet in point of fact we have only one hawk—the sparrow-hawk (the goshawk is a very rare vagrant)—and four falcons—the peregrine falcon, the merlin, the hobby and the kestrel. Of these five birds, the most common are the sparrow-hawk and the kestrel, the former a fierce and dashing pirate of the hedgerows living almost exclusively on small birds, the latter, well-known from its habit of hovering on apparently motionless wings, lives largely on mice and voles, and is a very good friend of the farmer. The sparrow-hawk is mercilessly hunted by gamekeepers but manages in spite of incessant persecution to hold its own very well. The kestrel, though occasionally shot by ignorant gamekeepers, may be found almost anywhere including the centre of London. Both are resident British birds, but in winter we receive a number of visitors of both species which come from the continent.

Falcon Visitors

The remaining three falcons are not so well known, and all three receive short shrift from the gamekeeper. The hobby, a very small falcon that does no harm at all to game, is a summer visitor to southern England, and is very rare elsewhere. The merlin, also a small bird, is the falcon of the mountains and moorland, and is both a resident and a winter visitor of which some merely pass through on their way from their breeding grounds in the north to winter quarters farther south. The merlin usually nests on the ground, the only one of our falcons to do so habitually. The peregrine, on the other hand, is a large and very handsome bird. Incessant persecution has reduced its numbers so severely that it must now be classed as rare, and though there are a number of eyries around our coasts the majority of the birds seen and shot, at any rate in southern England, are passage-mi-

grants. This is the falcon beloved of falconers, and the “stoop” of a peregrine is a lesson in pure grace and speed that once seen will never be forgotten.

Harriers

None of our three harriers is common. Two, the marsh harrier and the hen-harrier, are resident. The former breeds sparingly in Norfolk and Suffolk; the latter breeds in Ireland, the Orkneys and the Outer Hebrides and very occasionally in Great Britain, most of those that are seen, and too frequently shot, being winter visitors. Montagu's harrier is a scarce summer visitor, but does visit some part of England and Wales to breed every year. All the harriers nest on the ground, and none does sufficient damage to game to warrant its being shot on sight. Fortunately this is being more widely recognized now and they are now unlikely to become extinct in Britain, a fate that has overtaken too many of our birds of prey.

We have three buzzards also; the common, the rough-legged and the honey-buzzard. The last is now a rare passage-migrant, though one or two have recently bred in southern England. It is absolutely harmless. The rough-legged buzzard is a regular winter visitor and occasionally turns up in considerable numbers. The common buzzard, a bird of majestic appearance and graceful soaring flight, is physically weak for a predator, is lazy by habit and cowardly by nature. Some gamekeepers still regard everything with a hooked beak as an enemy, but most have now realized that the common buzzard does no harm to game, devoting its attention to young rabbits, mice, voles and so forth. As a result of this the common buzzard has increased greatly in recent years, and within the last two or three has bred successfully in the counties of Surrey and Hampshire, a considerable





GULLS IN WEST

extension of its normal westerly range.

All the birds so far mentioned are diurnal in habit. It is usual and natural to think of owls as being nocturnal birds, but of our five owls two hunt by day—the little owl and the short-eared owl. The former is an introduced species that has spread enormously since its introduction. Although a very small bird, it is also a very fierce little bird, but the common idea that it is harmful to game has not been proved and there is a good deal of evidence that it is not. All the same it is for a predator exceptionally prolific and there is every reason for keeping its numbers down. Introduced species are rarely wholly welcome in their adopted country and the little owl is no exception. Of our other owls, all are the friends of man, be he farmer or gamekeeper or sportsman. The short-eared owl, a ground-nester, breeds occasionally in England and regularly, if locally, in Scotland, but is most common as a winter-visitor and sometimes, for example during a vole plague, turns up in great numbers. The long-eared owl, the tawny owl and the barn owl are residents, exclusively nocturnal, and by no means uncommon, although the long-eared is to be found locally and the barn owl is less common than it was, say, twenty years ago. The long melancholy hooting of the long-eared owl cannot be mistaken for the regular *tu-whit tu-whoo* of the tawny any more than the latter can be mistaken for the unearthly screech of the barn owl. Owls are protected in England—the little owl is an exception in some counties—and in their case the law is observed by all countrymen.

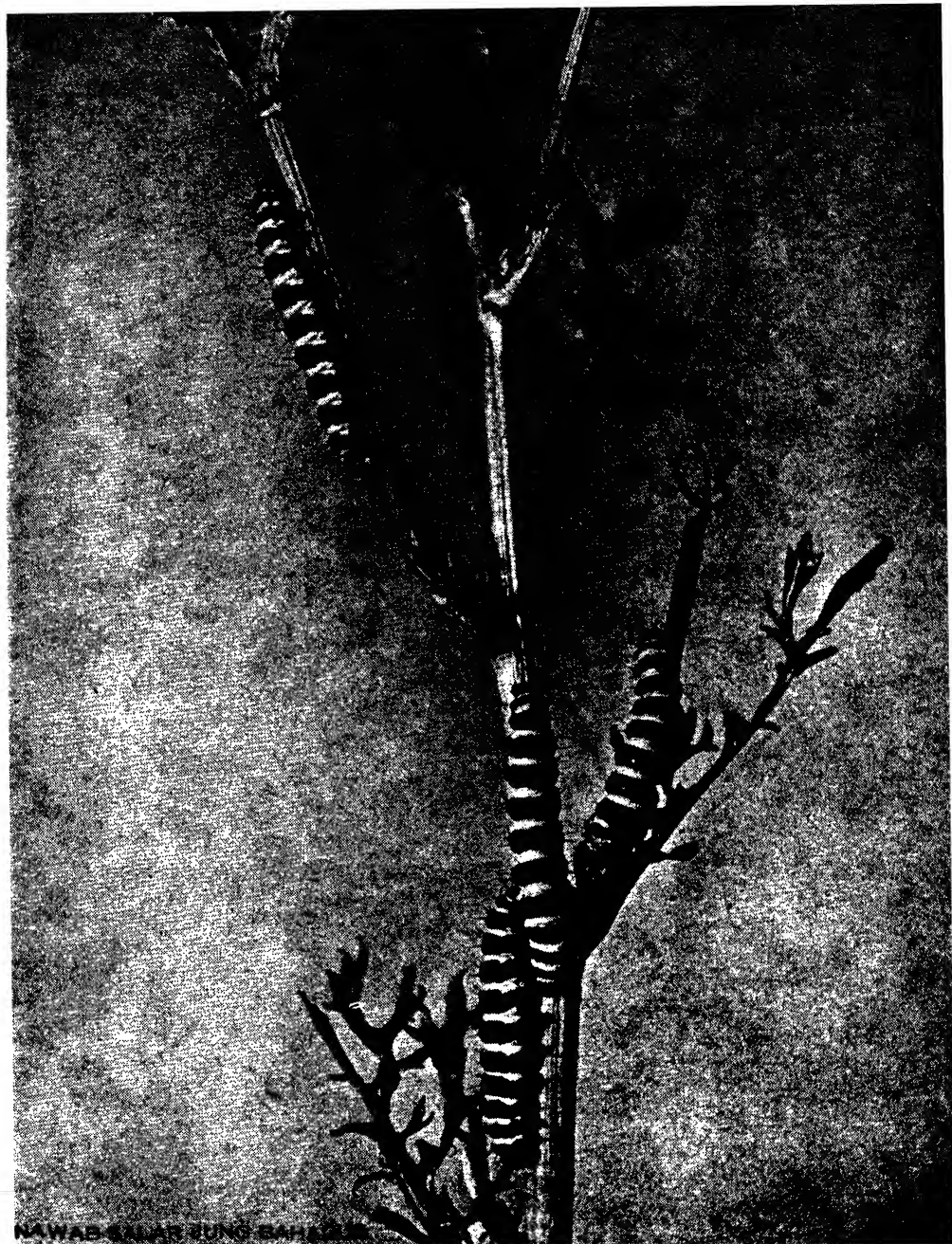
Super-Predators

Since most sea birds live upon fish, they too, are essentially predators. Yet within the group of sea birds there are super-predators—the gulls, who prey

not only on fish but also on other birds and animals—and even more super-predators—the skuas—who prey upon the gulls. There are 63 sea birds on the British list, made of terns, gulls, skuas, petrels, shearwaters, auks and the gannet. Eight auks figure on the British list. Of these the razorbill, the guillemot, and the puffin are well known. Of the terns, frequently called sea-swallows, five breed in England. Of the 16 gulls, six breed in England. With the exception of the kittiwake, an exclusively sea-going gull, our gulls are beoming more and more addicted to the land, finding they can pick up an easy living from man. The black-headed gull is now common along the Thames and even far inland, and has even taken to visiting dust-bins in suburban streets! And it is not altogether unusual to see both the black-backed gulls, big and powerful birds, and the herring gull far inland. Gulls take a long time to reach maturity, and immature birds are not always easy to distinguish the one from the other. Inland gulls are a nuisance and do a good deal of harm by their marauding tactics, yet there are few more beautiful sights than that of gulls following a plough.

The Insect World

If it was impossible to deal with 424 different kinds of birds individually, the position with regard to insects is very much worse. There are more than 12,000 different kinds of insects in the British Isles; and that number refers only to true insects. Strictly speaking, insects are creatures that have six legs, one pair of horns or antennae and have their bodies divided into three parts. Now, this grouping does not include spiders, centipedes, woodlice or worms. Spiders, mites, centipedes and woodlice are known under the general term *Arachnida*. They have more than six legs, and the head is part of the thorax.



LARVÆ OF THE CINNABAR MOTH. *They are here seen feeding on their favourite meal of ragwort. This moth belonged to the migratory groups which came to Britain from abroad. Comparatively recently however large numbers of them suddenly appeared on our north-east coasts and since that time the moth has become a familiar resident.*



The position is further complicated by the intricate life-history of insects proper. The great difference between mammals and insects is that mammals have their bones on the inside and insects have theirs on the outside. Mammals have their muscles outside the bones and attached to them. Insects, strictly speaking, have no bones inside them at all: the only hard part of

THE GRASSHOPPER (below). *Green, brown or yellow may be the colour of this noisy insect. The chirping is produced by rubbing the femur and wing together.*

HATCHING OF A DRAGONFLY.
The empty nymph case is attached to the reed below the insect.



an insect is its outer shell, which completely covers it and all its muscles are attached to that shell. Naturally, the thickness of the shell varies with different insects, so that some have harder shells than others. Thus caterpillars have a very thin shell, so thin that it seems soft to our touch. In all insects the shell is thinner at the joints, so that when the muscles work the joints bend, and by this method the creatures move.

How Insects Breathe

Insects breathe in a different way from mammals. They do not breathe through their mouths or noses but through a number of holes in their sides that let the air into a system of tubes which run all through their bodies. Finally insects do not grow like other animals. Their shells are solid and cannot grow: so the only way an insect can grow is by crawling out of its shell. This process is called "moulting". When the insect crawls out of its shell it is covered by a soft coat—so soft that it is almost liquid—but this soon stretches and hardens into a shell that is a better fit than the old one. All insects moult a good many times in their lives and most of them grow larger with each moult, but in their last two moults they undergo such extraordinary changes that to all intents and purposes they become different creatures.

All insects leave their eggs as tiny grubs. The correct name for these grubs is larvæ, but the grubs of many insects have their own particular names—maggots, caterpillars and so on—and larvæ is a general name covering all the others. It is only in the larval stage that insects grow, but except in size these larvæ do not change very much. At the end of this larval stage there is a moult, and at this moult most insects enter the pupal stage. They become motionless, they do not eat, they scarcely breathe.

The pupal stage is a dormant period during which the final perfect insect is formed. The last moult of all is when the perfect insect crawls out of its pupal skin and appears as the imago.

The Grub and Larvæ

The three stages of an insect's life—larva, pupa and imago or adult—are very often absolutely different in every respect. So much so, in fact, that it is common to regard them as three separate creatures. They are the same creature in different guise. After the final moult they do not change again, nor do they grow. Little flies never become big flies, nor, with the exception of the mayfly, does any insect have wings until after the final moult. And it is only after the final moult that they mate. Adult insects eat very little. Their main concern is to produce a family and to provide for it.

It is often said that butterflies are only found in summer. That is quite inaccurate. As a general rule, adult butterflies are only found in summer, but quite a lot of our butterflies hibernate through the winter in the pupal stage and the finding of a pupa in winter is in fact the finding of the butterfly in disguise.

September is a good month for butterflies and moths. Of the adult butterflies of autumn the Red Admiral is by far the most handsome. It is a strong and determined flyer, never fluttering about aimlessly as do so many of the butterflies of summer, and it has a particular fondness for buddleia. And in September, too, the migratory moths (some are also migratory in spring) reach Britain in numbers. Of these the Silver Y is probably the most common. It is by no means the most striking. The great hawkmoths—like the *Convolvulus* and the *Death's Head*—which reach us, though never in great numbers, in late summer and autumn are magnificent



HIGH BROWN FRITILLARY. *Nut brown in colour it is strongly marked with black spots.*

creatures, almost awe-inspiring in the strength and determination with which they fly, and their caterpillars are very large and impressive. That of the *Convolvulus* feeds on the lesser bindweed, but there is no evidence that it survives the winter—even in the pupal stage—except under artificial conditions.

A smaller, but very beautiful hawk-moth sometimes seen at this season is the Humming-Bird, which gets its name from its habit of hovering over flowers and sampling their nectar with its long proboscis, in very much the same manner as the bird of the tropics. Its appearance, too, is not altogether unbird-like with its curiously flattened abdomen. There are plenty of beetles about, too. Water-

beetles in numbers, and under the leaves and other rubbish of autumn the Devil's Coach-horse. This is, too often, destroyed by gardeners along with the Cockroach or black beetle, a most unpleasant creature to have in a house and a most useful one to have in a garden, for it will attack and kill caterpillars many times its own size. The large violet Ground-beetle, which has the margins of its wings copper-red, is also killed by many gardeners but it is just as useful as it is beautiful.

September is the month for wasps and for some of the less pleasant flies. Most of the wasps are workers. The egg-laying capacity of the queens is slackening, the life of the nest is drawing to an end, and the communal spirit that has been so strong throughout the summer is flagging. The wasps come to the sweets—the fruit and jam. They no longer have to worry about finding food for the millions of grubs, but can now satisfy their own tastes. The wasp stings, and its sting carries poison,

but the biting and bloodsucking flies of autumn are a far greater menace to humans. The wasp is a cleanly animal, the fly an excessively dirty one. The stable-fly and the female mosquito—the mosquito and the gnat are the same creature—are the worst offenders. The male mosquito hardly ever attacks human beings but both sexes of the stable-fly are equally voracious. Happily there are plenty of dragonflies abroad in September, and the dragonfly though quite harmless to man, is a deadly enemy to the gnat.

Happily, too, there are many spiders abroad. The spider—not being an insect—has no larval or pupal stage. It emerges, a tiny spider, from the egg, and

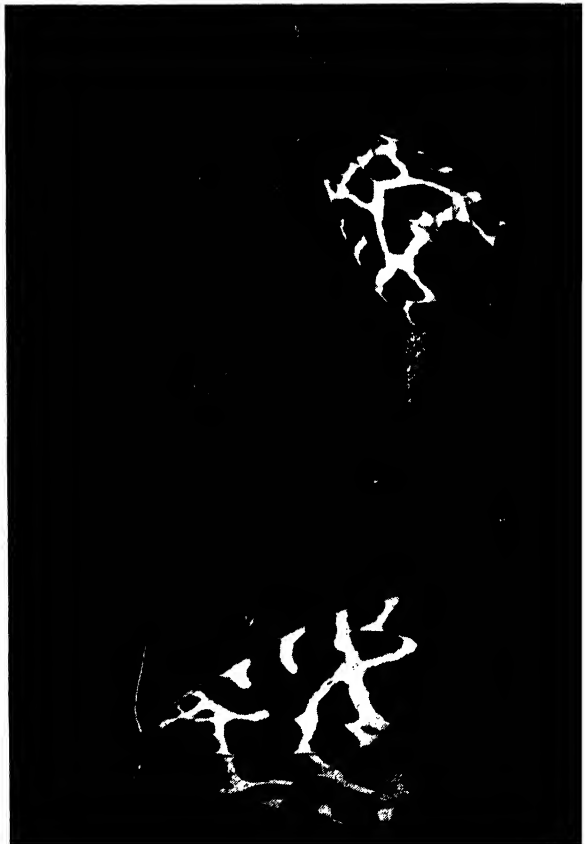
proceeds to grow in a perfectly normal way. Every one must have seen the multitude of webs that decorate the hedgerows, and, indeed, every square foot of ground after a heavy dew in autumn. And all these webs—wheel webs, sheet-webs, tunnel-webs and so forth—catch flies. If it were not for the spiders the flies would be a menace indeed. The most magnificent of the webs of autumn is that of the large, and very common, garden spider. This is the perfect wheel web, and once it is damaged it is deserted for no spider ever repairs a web.

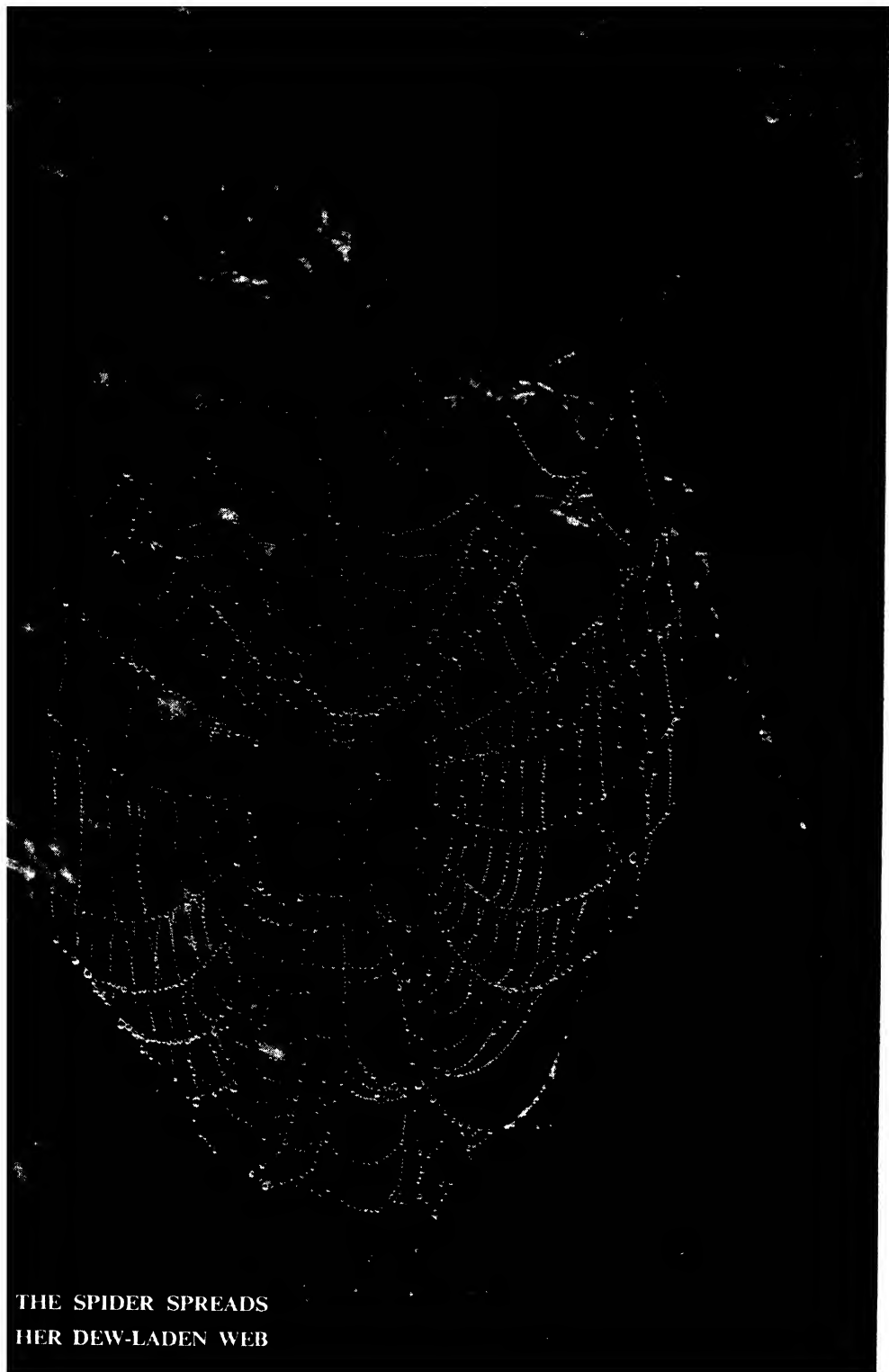
The young spiders hatch out in October, usually after a warm day, and the whole countryside seems to be covered with little silken streamers, gossamer threads, these hang from every branch, every fence, along every wall, even in the grass of a lawn. Young spiders make their first journey into the world by parachute. What happens is this; the baby spider climbs as high as it can and then turns to face the wind, it then lifts up its abdomen and lets out a drop of silk which is caught by the wind and drawn out into a thread about a yard long. As it reaches its maximum length the young spider is dragged from its perch and started on a journey that may last a few yards and may last a few miles. It is all very haphazard so far as direction is concerned, for the spider must go where the wind wills. But so far as the length of the journey is concerned the young spider is not entirely helpless for it can draw in its gossamer threads and by doing so, it descends.

Not all spiders make webs. The wandering wolf-spider, often to be met with at this time of the

year, carrying the egg-cocoon around with her, makes no snare, but relies upon speed to secure her prey. She is a most devoted mother and guards her cocoon, and cherishes her young devotedly. But she is not a devoted wife, and should her husband be rash enough to cross her path he meets a sudden end and helps to nourish his spouse. Other spiders that do not spin webs but can be found usually in thick herbage, are the crab spiders, so named from their habit of walking sideways. They are experts at catching flies by stalking. The harvest-spider, long-legged, lethargic creatures, fond of resting on fences, broad leaves and grass-stalks, are not true spiders, for although they have eight legs they have

GARDEN TIGER MOTH. *So named because of the tiger-like colour and pattern of the wings.*





THE SPIDER SPREADS
HER DEW-LADEN WEB

no "waists". The long, very slender legs are often damaged and not infrequently one is lost, but the loss does not appear to incommode the owner in any way.

Not many moths fly during the winter. The mottled amber may be found during November and warm December, and the *Chaimatobia* are quite common around lights. Some moths and some butterflies hibernate as adults. Of the moths the angleshades and the herald are the most usual find, but both conceal themselves very well indeed, and require careful searching and keen eyesight for their discovery. The former prefers to lie among fallen oak-leaves, the latter in outhouses and dark corners generally.

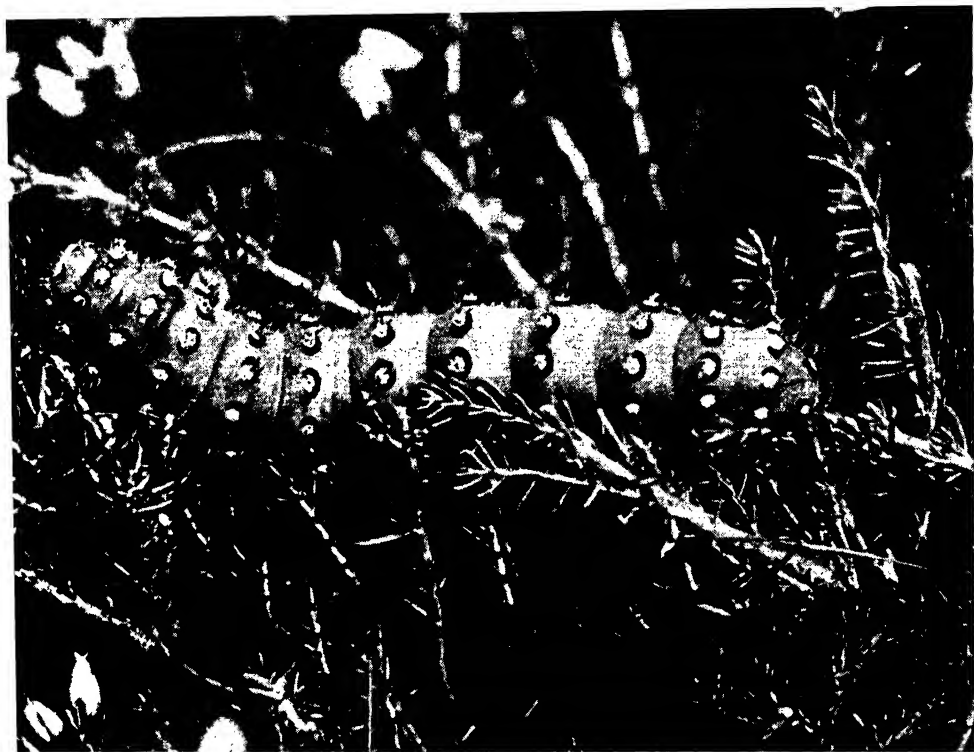
Of the butterflies the small Tortoiseshell and the Peacock are the most common. They will hibernate almost anywhere and appear quite lifeless with legs straddled and wings closed above back. But a touch on the proboscis will produce immediate response. In a dead insect the proboscis is brittle and will, as a rule, break at the slightest touch: in a live insect, even in the depths of winter sleep, it will be immediately withdrawn at the slightest touch. But the hibernators are few and far between, and the naturalist who is really keen on butterflies, digs for them during the winter months. A very large number of species, both of butterflies and moths, pupate underground. Pupa digging can be undertaken from October or November to February, but it is obvious that in general it is better to dig early than late, for as the winter advances, the risk of disturbance by mice, earwigs, pheasants and other birds, or of damage by fungus or damp increases. All the same, thousands of pupæ remain unharmed throughout the winter. Pupa digging is not hard work. A small garden fork is all that is needed and few cocoons will be found deeper than

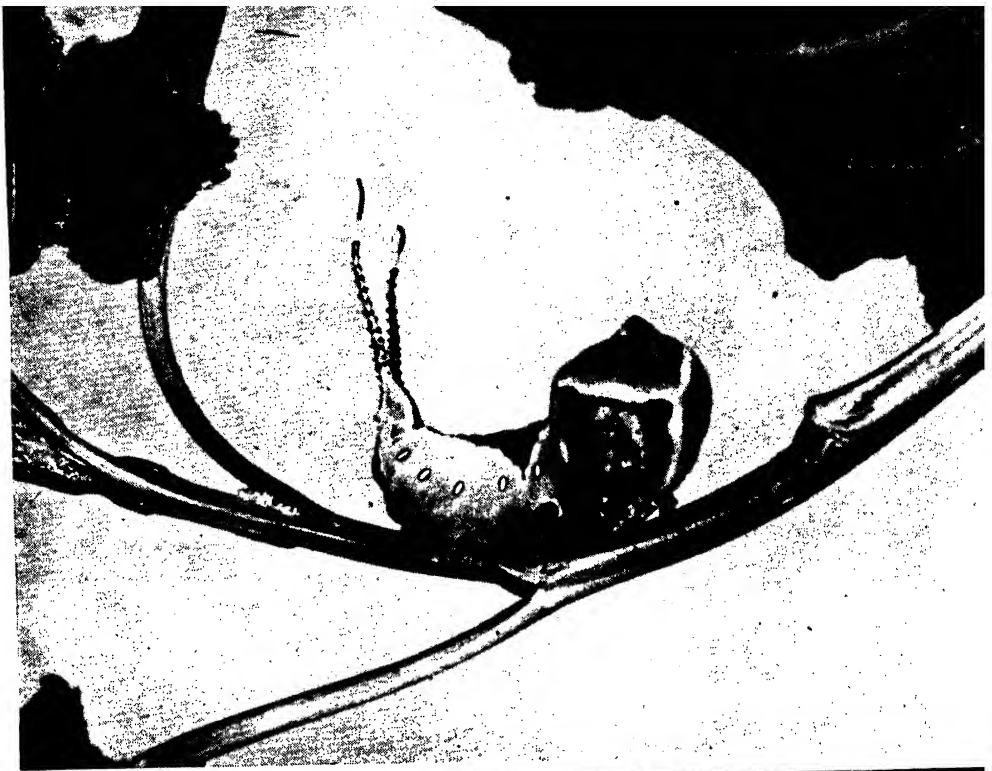
three inches. Many are set between the roots of trees and at about eight inches from the trunk. In woods cocoons are more often on the trunks than between the roots. But both in woods and in more open situations, it is noticeable that the larvæ choose the northern side of the tree to pupate. Incidentally, resting adults at all seasons of the year show a marked preference for the northern side of the object on which they are resting. Trees in the open offer better chances than trees in a wood, and trees near water offer the best chances of all. Conifers attract only a few species, and the best trees are poplar, elm, oak, birch, willow, hawthorn, beech and ash.

Winter Sleep

Many beetles also hibernate and they may be found by much the same methods as the pupæ of butterflies and moths. Beetles are not fastidious, they will hibernate in the earth, but they also hibernate under loose bark, under moss, in crevices of tree bark, in rubbish heaps, or in some decomposing corpse. They are, however, very susceptible to changes in the weather. Any warm fine day will bring forth its beetles, either adults from hibernation, or adults tempted forth from the pupal case before their time. Ladybirds, in particular, will appear, sometimes in swarms, on warm winter days, and the industrious little dor-beetle—one of the gardener's very best friends—is invariably busy on every day of reasonable temperature. Spiders, too, must be looked for on the ground. No spider is really active through the winter months, though some of the cave spiders sleep only fitfully. But search under stones, old logs and so on, will always result in a spider or two, sluggish in the extreme and very easy to catch.

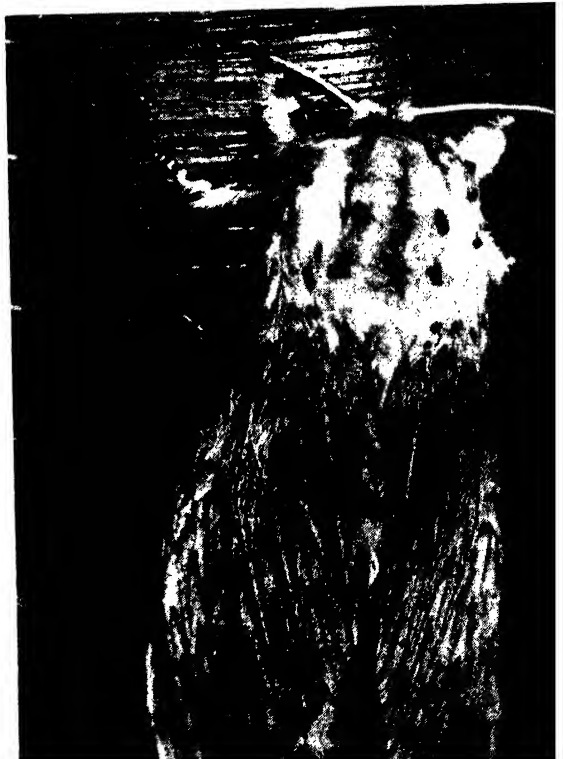
With the coming of February there is a noticeable increase in insect activity. The first early brimstone butterfly is





EMPEROR MOTH. *On the left page can be seen both the caterpillar above, and the male and female moth below. The caterpillar is very prettily marked, being first black, then changing to green, its segments marked with a black and pink ring. When hatched this handsome insect has a striking eye spot on each of its four wings.*

THE PUSS MOTH *is shown on this page. The caterpillar (above) has a forked tail from which it thrusts two scarlet threads when alarmed. It is bright green and striped with white. The moth on the right is light blue-grey in colour with black markings.*



often to be seen in February; the first centipedes are about, there will be gnats dancing in the shelter of some hedge, and the first crocuses, even the snow-drops, will be visited by the bees from the re-awakening hive. In March there will be more brimstones, some comma butterflies with ragged wings, small tortoiseshells and winter bedraggled peacocks, and angleshades and heralds come out in the evening. By the end of the month, the first larvæ will be busy on their food plants, but it is not until April that the full stream of butterflies and moths commences. Then the "sugarer" gets busy, and the collecting season begins. The beetles, too, regain their energy in March and in April, one which has become notorious as an enemy of man is sometimes exceedingly plentiful. This is the Heather-beetle, and it is quite capable of destroying a large area of heather and so indirectly, having an adverse effect on the red grouse, whose staple food consists of heather.

Spring Awakening

In April, also, the flying beetle first forces itself upon the notice of man, generally by finding a watery grave in our eyes (a great number of the "flies in eyes" are in reality beetles) and adding injury to insult by exuding, as it dies, a small drop of stinging fluid.

The wasp nest is now in the process of formation. The queen comes forth from her long sleep and sets about the business of making a small nest, which will soon grow into a large colony. The queen wasp was the first paper-maker in the world and she gets her paper, just as we do, from wood-pulp. She strips a fragment of wood from some fence and masticates it into paper, adding saliva as she does so, and producing a paper lighter and much stronger than anything we can produce with all our machinery. Every queen wasp killed in

April means thousands fewer wasps in autumn and so more fruit, but it also means many more insects more injurious to man, if not so noticeable. The wasp is entirely carnivorous, and it is not always good policy to kill the queens.

The Busy Bee

Hive bees, the only insects domesticated by man, are busy about the flowers, providing us with honey and at the same time performing a much more useful and an absolutely essential, task; that of fertilizing the plants. Earwigs are having families; and the despised, and often loathed, earwig ranks right at the top of the insect group in one way for the female is a good mother, blessed with strong maternal instincts, and she really does care for her family in a way that no other true insect attempts to emulate.

From May until the end of autumn there are so many insects about that it is quite impossible to keep pace with them. Butterflies abound, dancing from flower to flower, for though every species has its own particular food plant or plants (like the cabbage for the large white) butterflies will visit any flower. All the same, study of the various food plants saves the collector any amount of trouble, for it is only on the food plant that one may find the eggs or the larva. One butterfly, however, has a preference for carrion. This is the Purple Emperor, one of our largest and most handsome butterflies, which prefers to fly around the tree tops and is, therefore, rarely seen and rarely caught by the average countryman. The Purple Emperor disdains flowers and the easiest and best way to tempt it down from the tree tops is to leave a bit of bad meat about.

Butterflies in general dislike the rain, and in wet weather or during showers seek shelter. Some of the day-flying moths, however, do not appear to mind wet nearly as much as they do cold



HONEY-BEES ON A COMB. *In the centre of this picture the queen bee may be seen surrounded by her drones. The value of bees to the fruit growers is considerable, for they perform the essential task of fertilizing as well as providing honey.*

It is rarely of any use to try "sugaring" on a cold night, but warm still nights, even though they be damp, are often very productive. Moths are much more enterprising creatures than butterflies. Butterflies at rest or asleep close the wings in one position only; moths have any number of positions when asleep. And again the colours of the sexes in moths are often very different. The common example is the Emperor moth (found in districts with some heather) in which the male is much more strikingly dressed and much more energetic than the female, a dowdy and lethargic creature, but possessed of compelling charms. A female placed in a box with gauze sides and left in the open in May or June will speedily attract all the Emperor males of the neighbourhood and some of them will come long distances to flutter and crawl over the box.

At high summer, too, there is a moth on the wing that looks remarkably like a hornet with its brown and yellow striped body and wasp-like shape. It has many of the actions of a hornet also, but the Hornet-Clearwing is, of course, absolutely harmless. The dress is protective. Mimicry in many insects has reached an astonishing level of development especially as camouflage.

Of the beetles of high summer, the Cockchafer and the Stag-beetle are best known. The former, the furry red May-bug, blunders into lights at nights and spends most of its day crawling on the ground often in peril of its life. For an insect it enjoys a remarkably long life, for it spends four years as a grub, so fat that it can hardly move, and those four years in gardens at any rate are spent in eating vegetables. Cockchafers are highly prized as food by bats and by pigs and by many birds, including poultry.

The Stag-beetle is our largest beetle, a great black creature with, in the male, a

very large pair of threatening "horns". These "horns" are really greatly enlarged jaws and they are not nearly so powerful as they look. They can scarcely nip a finger, and altogether the stag-beetle is a very docile creature with a fondness for sugar. The males fight when they come across each other, the idea being to turn the opponent on its back rather than inflict injury.

In the hedgerows and by the lanesides the glow-worm brings a light to the June nights. It is often said that only the female wingless beetle glows—but actually the winged male can produce a faint light and so can the larva, while the pupa when touched emits a faint responding glow. The marvels of the insect world are unending. The glow-worm has accomplished something that man with all his ingenuity has not succeeded in doing, for the glow-worm can produce light without heat.

Active Ants

From July onwards to autumn caterpillars abound. Some assemble in numbers like the Cinnabar, which feeds on ragwort and has been exported to New Zealand to cope with the plague of the weed there, and some, like certain of the hawk moths, are very solitary and take much patience to find. But the most common insects of the late summer and early autumn are the ants. Ants are the most highly organized of the insects and have received much study from man. There are several sorts of ants, and in each nest several classes—female, male, worker and soldier—each with its particular function to perform in the ant-state. But it is in August when winged ants appear in quantities that we really notice them. It is always the winged males that appear first, closely followed by the females. For some while they will swarm on the ground then the males take flight and the females follow. They may

go to great heights and they provide a feast for the birds, but go they must for the courtship must take place in the air. The spent males drop to the ground and perish, but the females come down, sturdy and strong, shake off their wings, which they will not require again and retire underground to become egg-laying machines and nothing else.

The ants are not alone in enjoying nuptial flight at this season. Mosquitoes and many other flies are busy about their mating. All flights by the diptera in high summer are not nuptial flights, of course, and the word cannot be employed in connection with ordinary circling flights of house-flies around the ceiling. But it certainly can be employed in connection with the pillar dance of the gnats. Now, on any still evening, gnats in their thousands gather together, form into long vertical columns and dance, rising and falling vertically, in the shelter of some tall hedge or among the trees. The column lengthens and contracts, without ever losing its vertical formation, and gives something of the impression of a pillar of smoke. Every now and then, particularly should a shower intervene, these columns are driven indoors, but the dance will continue in the corner of the room. In the confined space the beating of many tiny wings produces a definite humming note.

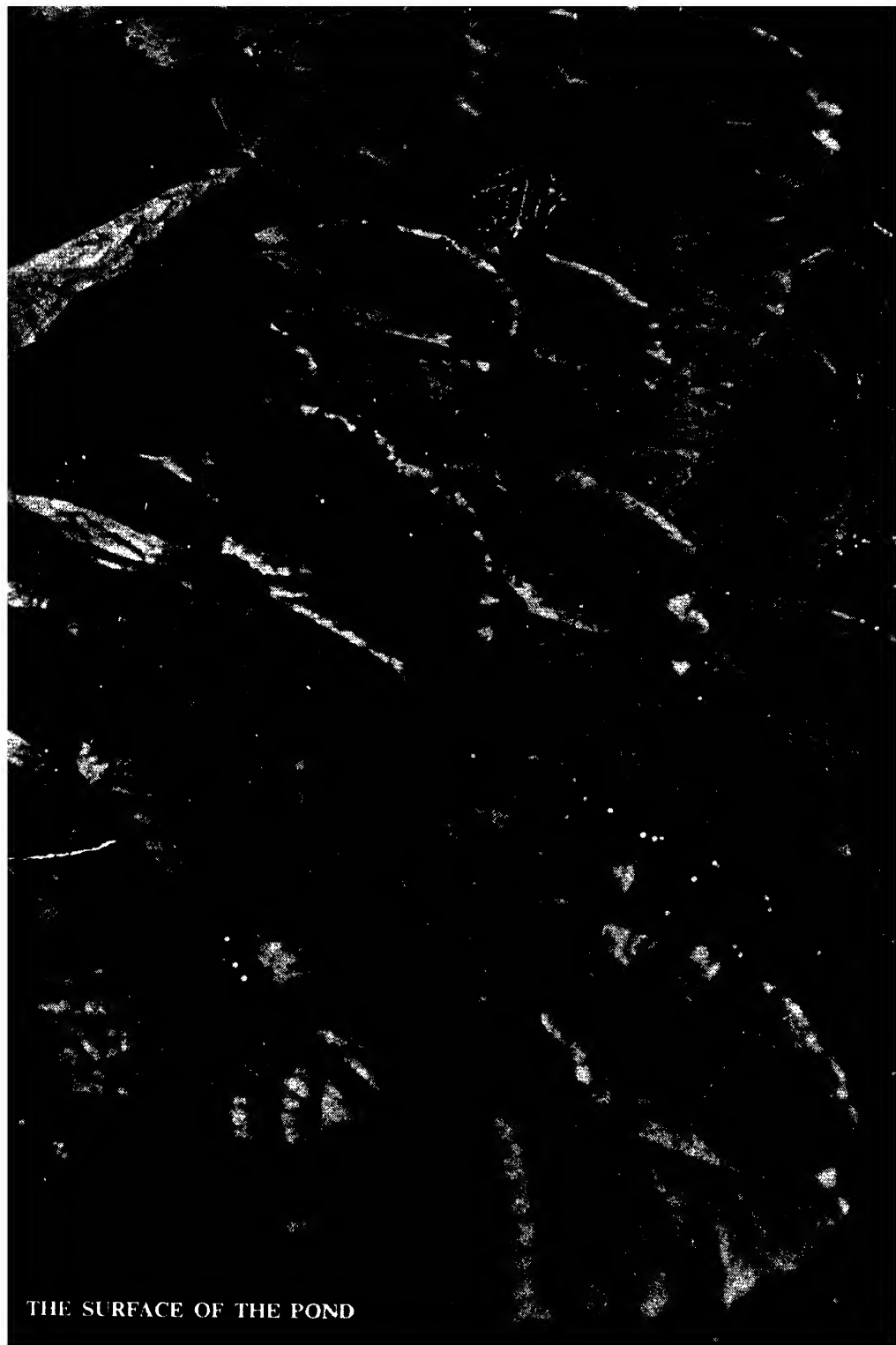
When the dance is over, a few of the insects will return to the open air, the rest seek ceilings and walls and windows and die. These are the spent males; the females have returned to the work of egg-laying. Now, too, the Crane-fly—the ungainly Daddy-long-legs—appears, blundering into lights and flickering over walls with long spider-like

legs. As a grub it did enormous damage to our lawns. The “leather-jacket” is deservedly hated by farmers, gardeners and cricketers alike, and the mature Crane-fly, harmless in itself, deserves harsher treatment than it usually receives.

With the close of the courtship flight of the ants and mosquitoes, with the appearance of the Daddy-long-legs, the insect year may be brought to a close. The spiders’ webs are everywhere, there are yet larvæ feeding on the leaves, and moths flying at night. The Red Admiral suns himself on the buddleia, the *Convolvulus* hawk-moth comes to us from abroad. Insect life has not ceased for the winter, but the courtship of the ants and the appearance of the Crane-flies are the last features of the year. All that happens thereafter is by way of preparation for the summer that is to come.

FEMALE STAG BEETLE. *This is the largest of the British coleoptera. The male has pincer-jaws.*





THE SURFACE OF THE POND



FRESHWATER LIFE THROUGH THE YEAR

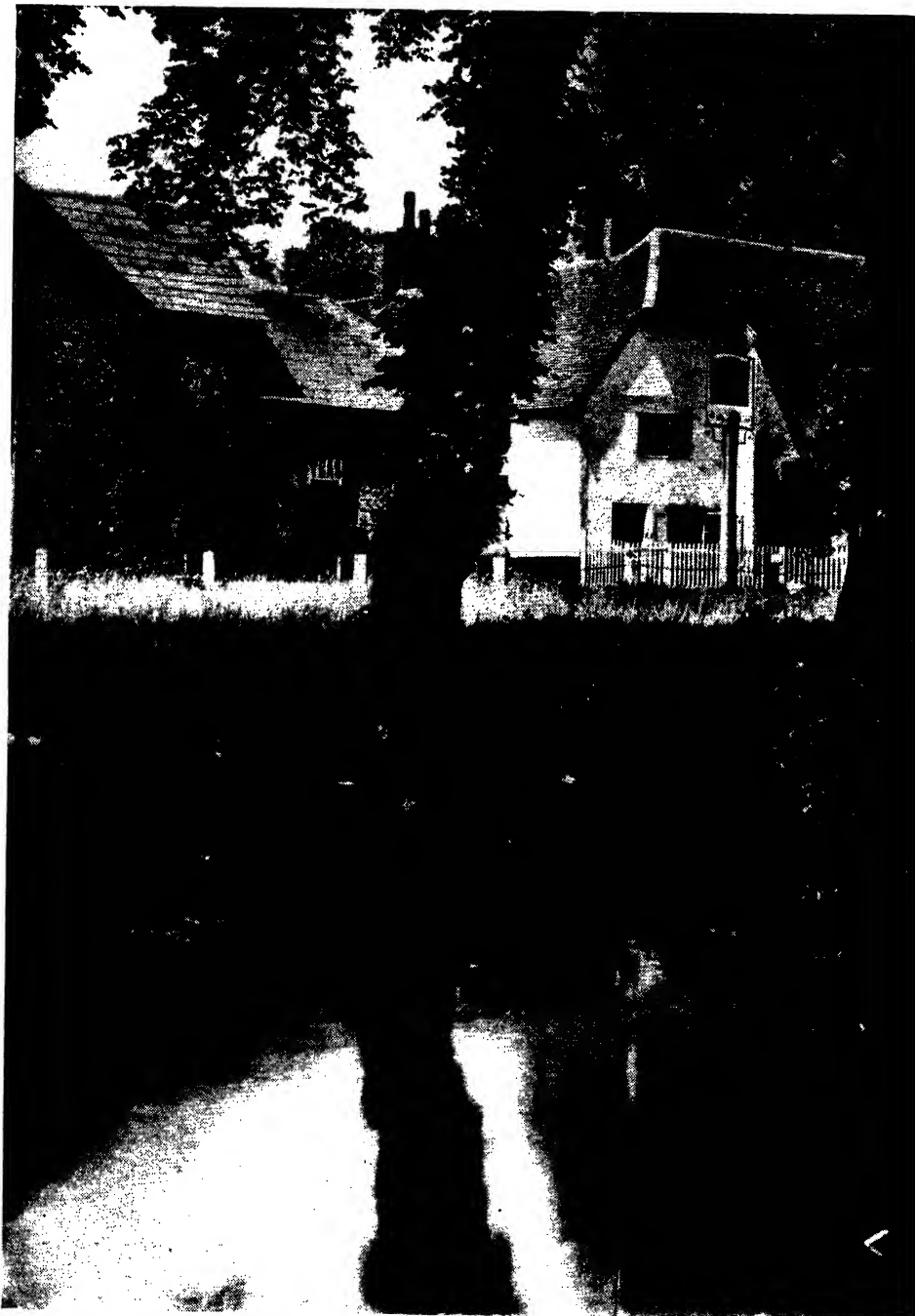
WATER has a great fascination for most people, whether they be professed nature lovers or not. The sea-shore, the lake, the river bank, the stream side are the most popular of resorts with everyone; while to the true nature lover even the humblest wayside pond can be a source of interest and delight. The fascination of a country walk is greatly increased if one knows something of the many wonderful creatures frequenting ponds and streams, and the season at which they may be sought. For in most cases these aquatic creatures do need seeking, as only a few thrust themselves on the notice of the casual observer; but anyone who does take the trouble to seek the denizens of pond or stream in their native element will be at once fascinated and amazed by their number and variety, as well as their remarkable forms and habits.

The spring is the natural time to start the observation of freshwater life, for this marks the revival of activity and the regeneration of life after the dormant season of winter. It is difficult, however,

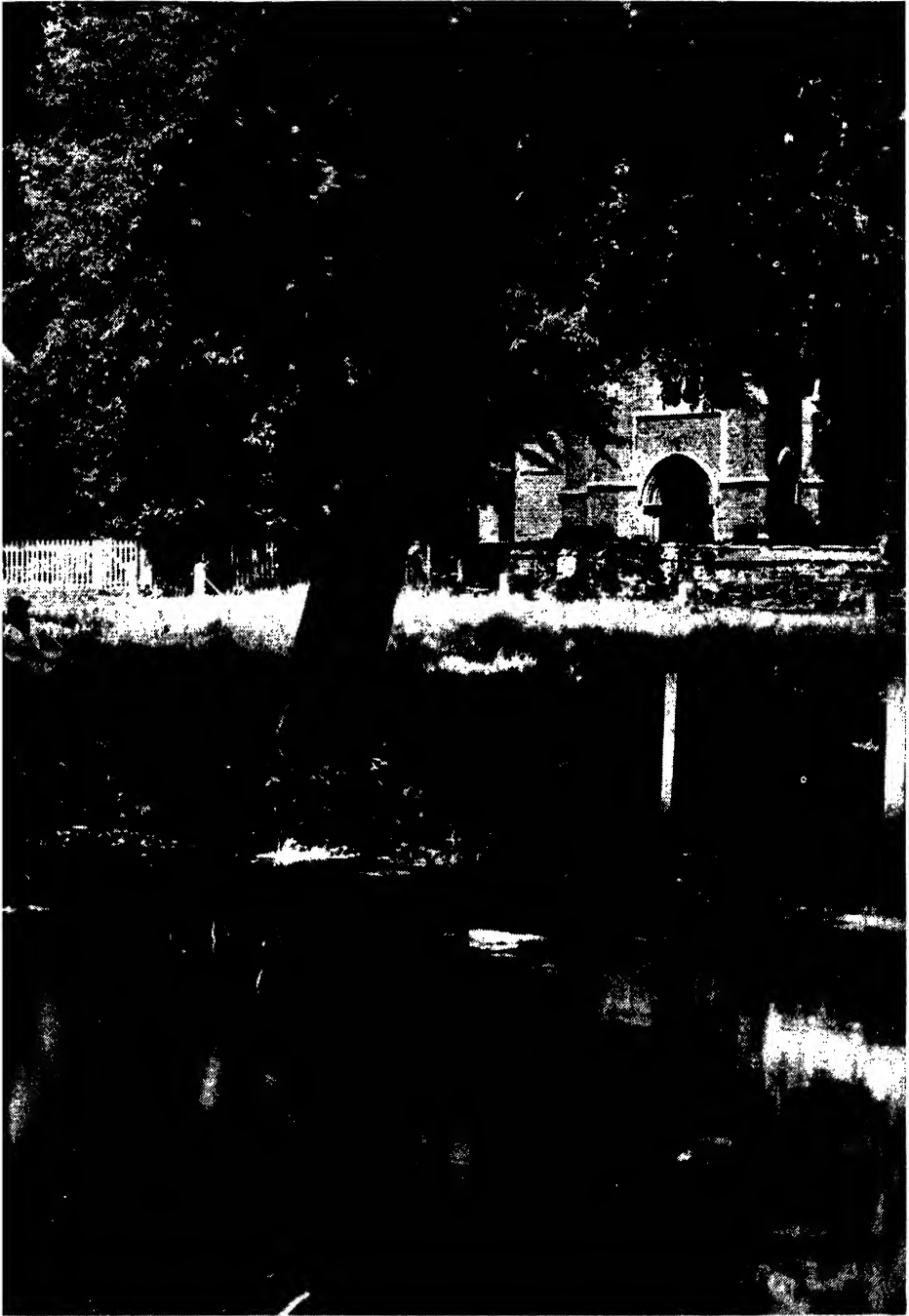
to fix even an approximate date on the calendar for such spring awakening, as so much depends on the season and locality. Signs of spring may be found in February or even January, which are winter months; but it is in early March, if the weather be favourable, that activity really begins in earnest.

Everything depends on the temperature and this fluctuates less in water than on land. Thus the submerged water weeds may be seen putting out new bright green shoots while the vegetation on land is still held back by cold winds and frosts. At this period there are usually some aquatic insects active—beetles, water bugs and various larvæ—which may sometimes be observed swimming about even under the ice should the pond be frozen over.

The first unmistakable sign of spring is the activity of frogs; since last autumn they have been in hibernation, but with the advent of milder conditions out they come in their thousands to seek their breeding haunts. One day in March, as you approach your favourite pond, or the



THE VILLAGE POND. *Inhabited by many remarkable creatures in summer and winter every wayside pond can be a source of interest and delight if one knows*



something of its denizens. Their number and variety, their development and habits can provide endless study and pleasure for even the amateur student of nature.



FROGS AND SPAWN. *Caught by the camera is the act of laying eggs. The male frog is seen gripping the female to squeeze the eggs from her. Note the eggs about the frogs that have already been laid. Below can be seen a mass of frog spawn hatching.*



still backwater of some stream, there is a sudden movement in the water and you catch sight of the long hind legs of a frog as with vigorous strokes it dives to the bottom. Closer inspection may reveal the water to be alive with frogs, usually couples engaged in love-making; but sometimes one comes across a struggling mass of several males all seeking to pay their attentions to a single lady. At this season one seldom sees frogs travelling to their breeding ponds, because they do it at night; but when they have to cross a road many come to grief under the wheels of passing vehicles and their squashed corpses litter the road in the morning.

Having once found the water, the male frogs croak throughout the night and thus guide others of both sexes to the rendezvous. Frogs are normally solitary

creatures, but at this season the call of love urges them all to seek the waters of their infancy and consort together in their thousands for their annual honeymoon. The females quickly become distended with eggs; these are coated with a thin layer of jelly which swells out greatly in the water and thus produces the familiar masses of frog spawn.

Toads are a little later in starting their honeymoon, often not until the beginning of April, and generally use different ponds from the frogs. As they continue their travels in the daylight, they are more frequently observed at this time, many couples pairing up before actually reaching the water. The male toads have a much louder and higher pitched croak than the frogs; they also sing their love song in the daytime, their note sounding very much like the quacking of ducks

LARGE COMMON TOAD. *This picture shows a toad greedily anticipating a fine meal of a golden spider and her sack of eggs. The toad family are distinguished from the frogs by the absence of teeth, and the toad's hind feet are only partially webbed.*



in the distance. Toad spawn is not in masses like that of frogs, but laid in long double strings which become draped over the water plants.

Every juvenile naturalist has kept jars of frog or toad spawn and watched the tadpoles hatch out, so that the general plan of their development is well known. In all essentials, the tadpole is a fish, limbless and dependent on its broad tail for motive power and breathing by means of gills. Towards the end of its aquatic life the tadpole grows legs, the back pair first, then gradually loses its tail, and at the same time develops lungs and becomes an air breathing animal. Truly a wonderful metamorphosis.

While watching the toads you may see a long wriggling form dart up to the surface, take a hurried gulp of air, and

A YOUNG FROG. *Its tubby shape proves that it likes its food, chiefly small creatures that live under water such as slugs.*



disappear. This is a newt, a creature distantly related to frogs and toads, though so different in form. In late March and April newts are abundant in all suitable ponds, where they resort for breeding purposes; though they are far less brazen in their love-making than frogs and toads, and act in a much more dignified and restrained manner. They also take much more care of their eggs, laying each one singly and carefully wrapping it up in the leaf of an aquatic plant. A newly hatched newt tadpole is a very delicate little thing and almost transparent, but soon darkens with age. The front legs grow first in newt tadpoles, rapidly followed by the back pair; so that the young newt soon becomes very like a miniature edition of its parents, except for the feathery gills at the sides of the neck, and these disappear before the little amphibian leaves the water at the end of the summer.

Of our three British newts the Smooth Newt is the commonest, though there are certain areas where it is not found. The Great Crested Newt is a much larger creature and not quite so common; while the smallest of the three is the Palmated Newt, which is comparatively scarce in most places, though it replaces the smooth newt in Wales and can also be sometimes found in the west of England.

Water Insects

Many aquatic insects become active as the spring advances. One of the earliest and most noticeable is the pond skater, one of the water bugs. This is a strange-looking insect with a long body pointed at both ends, and four exceptionally long legs with which it can rest on the water without getting wet and without its body touching the surface. By means of quick jerks of its legs the pond skater darts about over the surface of the water with great rapidity; some kinds are also found on running water. The front pair



A SWARM OF TADPOLES. *These lively creatures become very active after hatching. Large numbers of them fail to reach maturity as they fall prey to many enemies in the water. They lead an aquatic life until their hind and fore limbs have appeared.*

of legs are quite small and inconspicuous, and are used by this bug for catching the insect prey on which it feeds. Like all bugs it feeds by suction, having a sharp beak with which it can pierce its victims and drink their blood.

The water boatman is sure to attract the notice of anyone watching the surface of the water, but it must not be confused with the pond skaters, which are sometimes erroneously termed "water boatmen". The true water boatman swims beneath the surface, and though its body is distinctly boat-like in shape and its long black legs act as oars, it is a submerged boat. The body of this insect is so buoyant that it can only descend to the depths of the pond by vigorous

strokes of its oar-like legs. As soon as it stops swimming, it rises and rests against the underside of the water surface with only the four front feet and the tail end of the body touching the surface film. The water boatman is a good flier, and in hot weather, later in the season, may sometimes be seen coming out of the water and taking wing.

Apart from these surface dwelling bugs, there are many other types of insects and their larvæ which lead a sub-aquatic existence; but they need to be fished out with a net before most of them can be seen at all, and then put in a jar or glass tank to observe their form and habits. Dragonfly larvæ, caddis larvæ, and various water beetles are all active



THE COMMON NEWT. *In search of food, he swims to the surface of the pond. Newts are ravenous creatures. They are remarkably tenacious of life and have great powers of reproducing lost or injured limbs. They are brownish-grey in colour.*

in early spring, but are unlikely to be seen unless specially sought. Pond water at this season is also alive with minute creatures which are too small for the unaided vision to appreciate, or to see at all in many cases. Some of these tiny Crustaceans are known as "water fleas", because of the jumpy way they move through the water. The best known types are *Daphnia* and *Cyclops*, the forms of which can be seen from the illustrations.

Though pond water is far more thickly populated with various types of animal life, to ramble beside a stream or river may seem more attractive than peering into the murky depths of some stagnant pool. In late May or early June, according to the season, one of the most remarkable phenomena in the insect world takes

place along many of our English rivers. This event is the rise of the May Fly, of great importance to anglers, for trout more readily take the angler's artificial lures when the real insects are on the wing in great numbers. There are many kinds of may flies, all delicately formed insects with long trailing tail-filaments and rather short gauzy wings. The commonest type lives for about two years as a larva burrowing in the mud of the river bed. Then one day along the river-side you find clouds of these gauzy insects dancing in the air in incredible numbers. This is their marriage flight—the one brief revelry of their lives; the air is full of them, while the margins and surface of the water becomes covered with their old larval

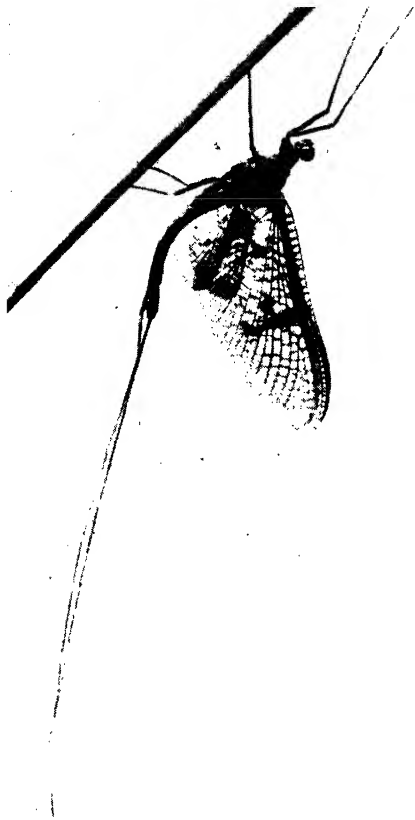
cases and insects in the act of emerging. Their life in the winged state is short indeed, for a day is the average length of their existence. The vast majority live not more than an hour or two, and multitudes perish within a few minutes of their emergence. Fish snap up the new-born insects as they rest helpless on the water, as well as any that drop on the surface. Swallows and martins swoop through the clouds of mayflies, making the most of the sudden abundance of food, while at dusk the bats continue the work of destruction. Yet countless myriads remain to propagate their kind.

The eel and the salmon are certainly the most interesting of our freshwater fish, if such they can be called. Both are migratory; the salmon is mainly a marine

fish that breeds in fresh water; while the eel, though spending most of its growing period in fresh water, begins and ends its life in the ocean depths. The life stories of these fish must be told at a later stage; but it is in early May that the young eels—slim little creatures not six inches long, called “elvers”—may be seen ascending rivers from the sea. Then a little later the young salmon—called “smolts”—go down the rivers to the estuaries, where they get their first taste of salt. Gradually they move further out into the deep waters of the Atlantic, where they remain, feeding and growing contentedly, until—years afterwards—they receive the strange urge that calls them irresistibly back to the fresh waters where they were originally hatched.

CRESTED NEWT. *This creature, when fully grown, attains a length of nearly six inches. Its back is a greenish-brown in colour and the under parts are orange spotted with black. Only the male of the species is furnished with a crest.*





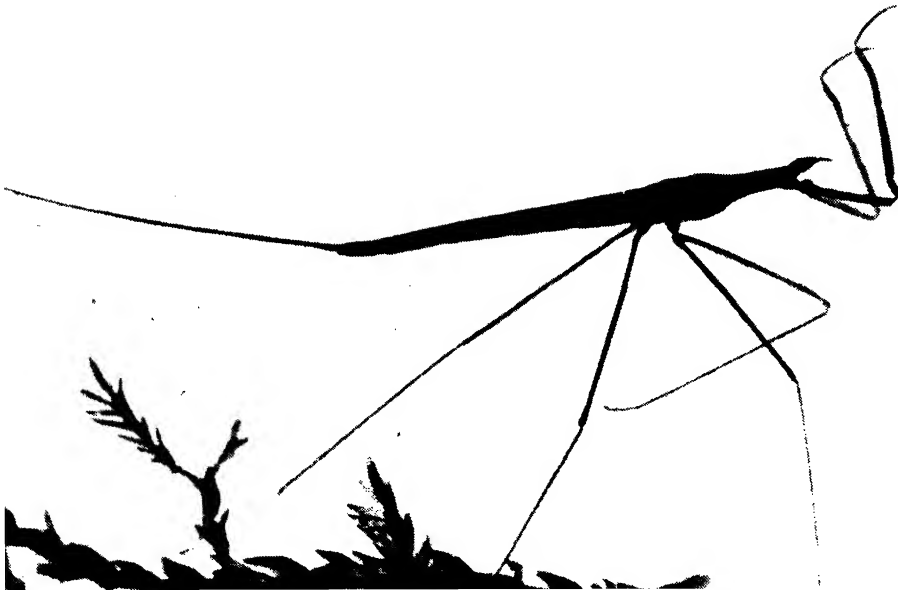
Spring passes imperceptibly into summer, and as the days lengthen and the temperature rises the pulse of nature quickens and the tide of life surges on to ever greater exuberance.

The sub-aquatic plants choke ponds and water-courses with their dense foliage; rivers become full of bright green masses of starwort and the darker thick waving growth of water crowfoot; water lilies may in some places completely cover the surface with their rounded leaves, while in others the same effect is produced by the broad-leaved pond-weed. Many a pond is obscured by a thick floating carpet of duckweed, while the slimy growth of green algae penetrates everywhere. A pond may often be seen at this season almost covered with white flowers; these belong to the pond variety of the water crowfoot, which differs from the river kind in producing

THE MAYFLY AND WATER SCORPION.

The picture on the left shows the long trailing tail-filaments of the mayfly.

Seen below is a water scorpion.



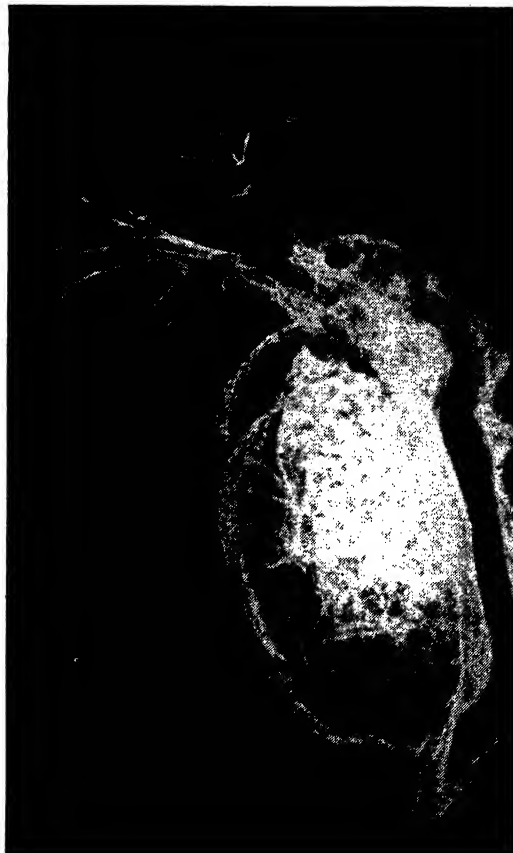


CYCLOPS AND DAPHNIA. *These curious transparent creatures are known as water-fleas because of their jumpy movements.*

broad floating leaves and flowering profusely. The frogs and toads have left the water long ago, and most of the adult newts will have followed suit before the beginning of June; but their progeny remains.

The tadpoles of frogs and toads will have legs by now and their tails are getting gradually shorter. Then suddenly one day after a shower of rain these little amphibians set out on their great adventure. They leave the water that sheltered them in infancy, and the countryside becomes alive with tiny frogs and toads that could sit comfortably on a sixpence many still retaining little stumps of their tadpole tails. Some country folk will still tell you that these little frogs come down in the rain; but of course this is not so, it is merely that the rain provides the stimulus that induces their migration.

One of the commonest of freshwater fish is the three-spined stickleback—the familiar “tiddler” of the schoolboy.





FATHER STICKLEBACK WITH HIS BROOD. *Lively little fish about two inches in length and grey and golden in colour, they have astounding pugnacity and at the time of the breeding season the males fight from morning to evening.*

Though present all the year round in most sluggish streams, it is in late spring and early summer that it becomes most noticeable. At this season the males glow with brilliant metallic colours—red, green and blue—and become very pugnacious. It seems a strange thing for a fish to build a nest, but that is what the male stickleback does. It is constructed out of bits of weed and debris from the water, stuck together with a slimy secretion. This done he seeks a mate, whom he chases around and eventually drives into the nest. Here the female deposits her eggs, which the male fertilises after laying, in the strange manner of fishes. He may persuade more than one female to oviposit in his nest, until he is satisfied with the number of eggs it contains. Thereafter he mounts guard over it and allows no other fish to approach. In due course the eggs

hatch into tiny fry like minute splinters of glass which feed on the microscopic organisms that the water brings them. The father still keeps guard over them, and protects them from cannibalistic relatives. Should any of the babies wander away too far, the father catches them in his mouth and spits them back carefully into the nest.

An interesting insect to be found at this season is the water scorpion, but it needs looking for. It is an expert at camouflage, and when resting motionless looks very like a small rotting dead leaf. It is very dark brown, and remarkably flat, being scarcely thicker than the leaves it mimics. It is very broad in proportion to its thickness, and the tail-end possesses a breathing tube half an inch long which represents the leaf stalk. Its two pairs of walking and swimming legs are long and thin, and can be folded up out of

sight beneath the body; but the front pair are developed into formidable talons with which the water scorpion seizes its prey. The luckless victims are then sucked dry by the sharp beak, which protrudes between a pair of wicked little eyes. There is really something rather repulsive about the water scorpion when seen with a still living victim whose life blood it is slowly sucking, while the little beady eyes seem to be gloating over the struggles of its helpless prey.

Insect Camouflage

A more elegant though closely related creature is the long water scorpion, or water stick-insect. This has an elongated narrow body, with a tail breathing tube of equal length, totalling about $2\frac{1}{2}$ inches, and the legs are proportionately long. The general habits resemble the common water scorpion, and the insect mimics a

piece of stick so well that it may easily be handled before its true nature is realized.

Though some dragonflies appear in May, it is in June and July that they are most abundant. The little delicate kinds with needle-like bodies—known as Damsel-flies—are among the first to be noticed. There are a number of distinct species; pale blue with black markings, red or green being the predominate colours. These are followed by a variety of larger kinds; magnificent insects of powerful flight and most fascinating to watch, as they hawk to and fro over the water, now and then pouncing on some winged insect or settling on a reed stem for a brief rest. These large dragonflies have lived in the water as larvæ or nymphs for perhaps two years before attaining the winged state; the length of their aquatic life depends on the food

DRAGONFLY LARVÆ. *The larval and pupal stages of the dragonfly's life, which last for about ten months, are spent under water where the creature devours various other small insects. Its underlip is extraordinarily long and shoots out to eat its prey.*





May Fly

*Dragon Fly
emerging from
nymph*

Pond Skater

*Water
Measurer*

*Gnat
Larvae*

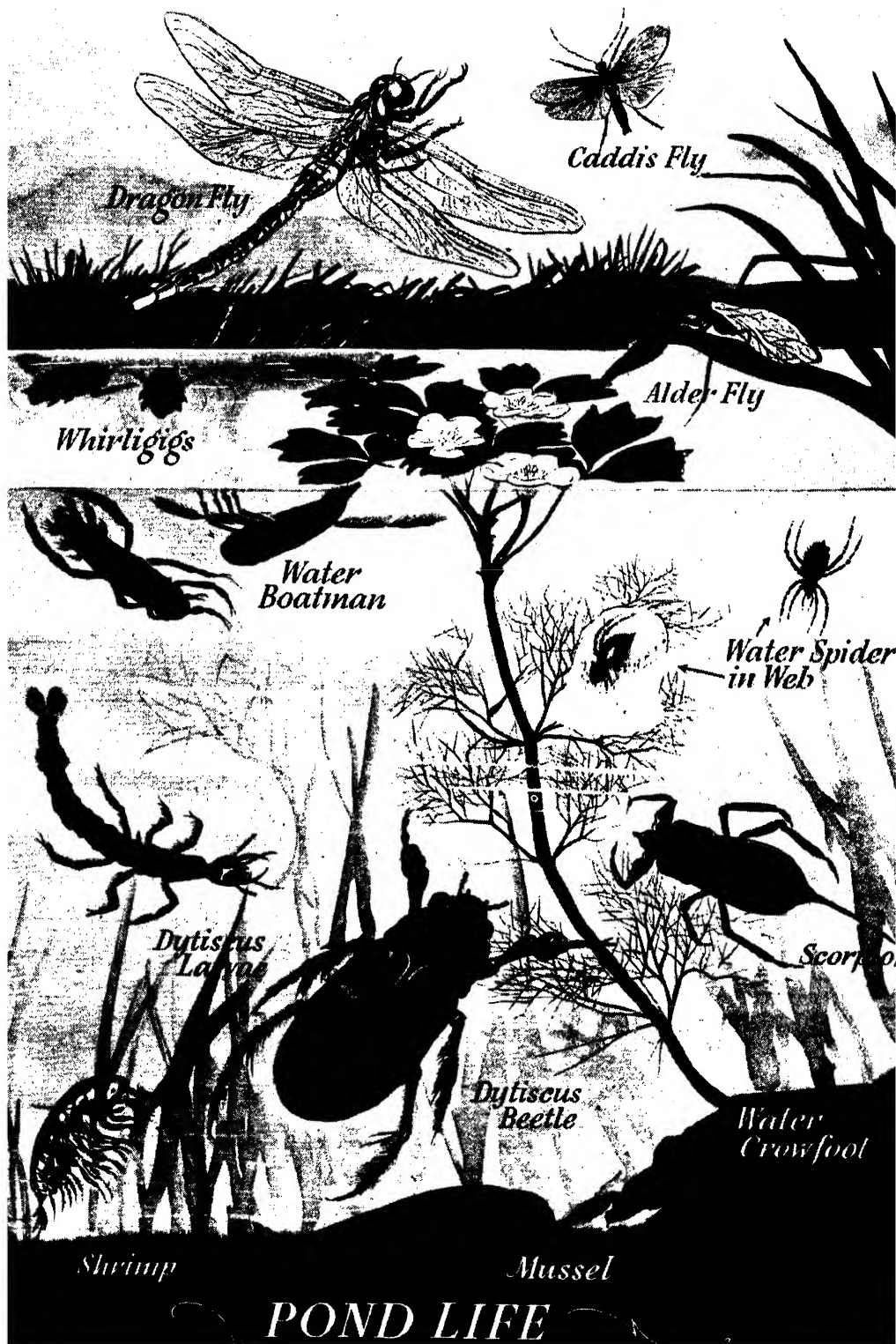
*Newt
(Crested)*

Tadpoles

Arrow Head

*Canadian
Pond Weed*

*Larvae of Dragonfly
on the Warpath*



Dragon Fly

Caddis Fly

Whirligigs

Alder Fly

Water Boatman

Water Spider in Web

Dytiscus Larva

Scorpion

Dytiscus Beetle

Water Crowfoot

Shrimp

Mussel

POND LIFE



THE BIRTH OF A DRAGONFLY. *In these pictures can be seen the development of a dragonfly. After some ten months in larva and pupa stages under water the pupa crawls up the stem of some aquatic plant, the skin of the back splits along the middle and the dragonfly protrudes its head and thorax. As the sun dries the gauzy wings, they unfold and after much waving become strong enough for the fully-fledged insect to fly off in search of food as seen in the photograph on the opposite page.*

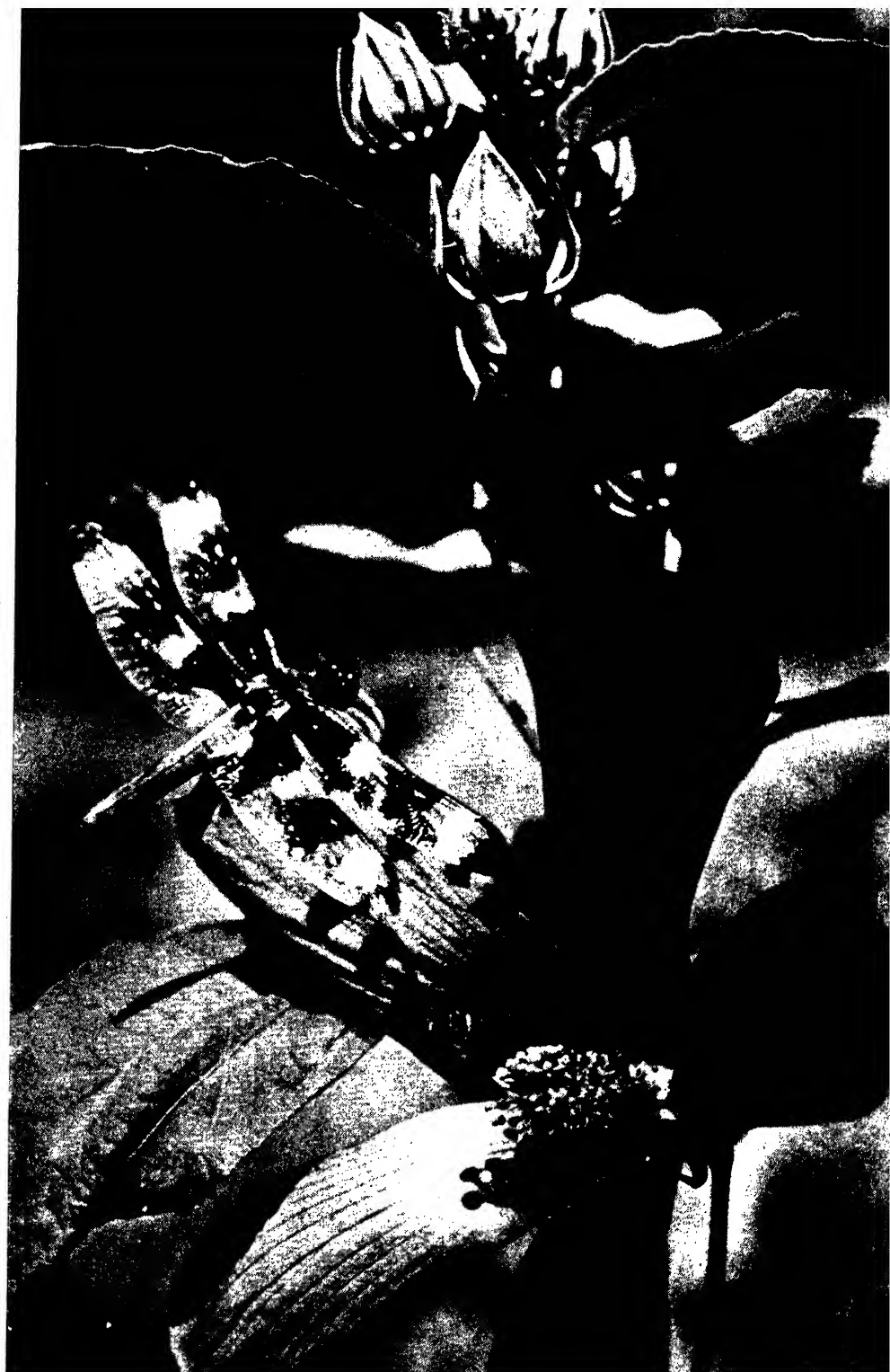
supply. Then one day the mature nymph climbs up a reed stem, its skin splits, and the winged dragonfly struggles out. The ugly nymph, grovelling in mud and slime, suddenly becomes a glorious winged creature of the air and sunshine. Anyone who is fortunate enough to witness this marvellous transformation sees a sight which makes a lasting impression on the mind.

Water Beetles

Among the water beetles most noticeable are the whirligigs, which perform their merry dance on the surface of every pond and slow stream. They may often be seen in hundreds, their shiny black bodies glistening in the sunshine, as they perform their ceaseless gyrations. Many other water beetles live in the depths of the pond and visit the surface periodically to renew their air supply.

Outstanding among these is the great water beetle, which is a large oval insect $1\frac{1}{4}$ inches long and $\frac{3}{4}$ inch wide. It is carnivorous in habits and the terror of all smaller pond dwellers. Even large creatures such as fish, newts and frogs are not safe from its attacks. Its larva is equally voracious, and has been called the "water tiger".

When pond weeds are pulled out of the water at this season small masses of stiff jelly are often found adhering to them. These are the eggs of water snails,







NEW FOREST STREAM



GREAT BLACK WATER BEETLE. *In spite of the fact that this beetle has two pairs of legs formed like oars for swimming, it is nevertheless a poor swimmer and therefore has to find its food from easily accessible vegetable substances.*

and if examined closely numerous little eggs can be seen within the jelly mass. It is quite interesting to keep some of these eggs in a jar of water and watch the development of the embryos within. There are many kinds of freshwater snails, which can be found at all times of the year, though the early summer is their principal breeding season.

Anyone who is collecting pond snails may sometimes be surprised to find apparently empty shells tenanted by small spiders. These are young water spiders, which live in empty snail shells during their infancy. The mother water spider makes a beautiful thimble-shaped silken nest among the weeds. This she fills with air by taking down bubbles attached to her downy body, and in this air-filled silken thimble the babies are hatched. Very soon the baby spiders set out on their own and seek the protection of

empty snail shells, which they fill with air and thus cause to float.

In late summer the young newts hatched in the spring are still in the water, long after the baby frogs and toads have left. These little newts, however, are reaching the end of their infancy; their feathery gills are rapidly disappearing and they are already breathing air in the adult manner. In a few weeks they will be mature in form, though diminutive in size, and will then leave the water and not return until three or four years later when they are fully grown.

It is impossible even to mention the multitudes of small creatures to be found in any pond at the height of summer; their number and variety are amazing. Numerous types of fly larvæ predominate, among which may be mentioned the gnat and mosquito larvæ which swarm to such an extent in any stagnant water that

is free of fish; also the red "blood-worms" found among decaying leaves at the bottom and which are not worms at all, but the larvæ of a midge. As the weeks pass all these larvæ mature and assume the pupa state, from which the flies soon emerge to reproduce their kind.

Autumn

By the end of the summer the period of generation and growth has reached its climax; autumn is the season of maturity. The flowering season is over, and aquatic and semi-aquatic plants are in fruit. The seed capsules of the water lilies have sunk downwards to the bottom, while the stiff pokers of the great reed-mace (usually miscalled "bullrush") stand erect, and the feathery tassels of the wall reeds wave in the breeze.

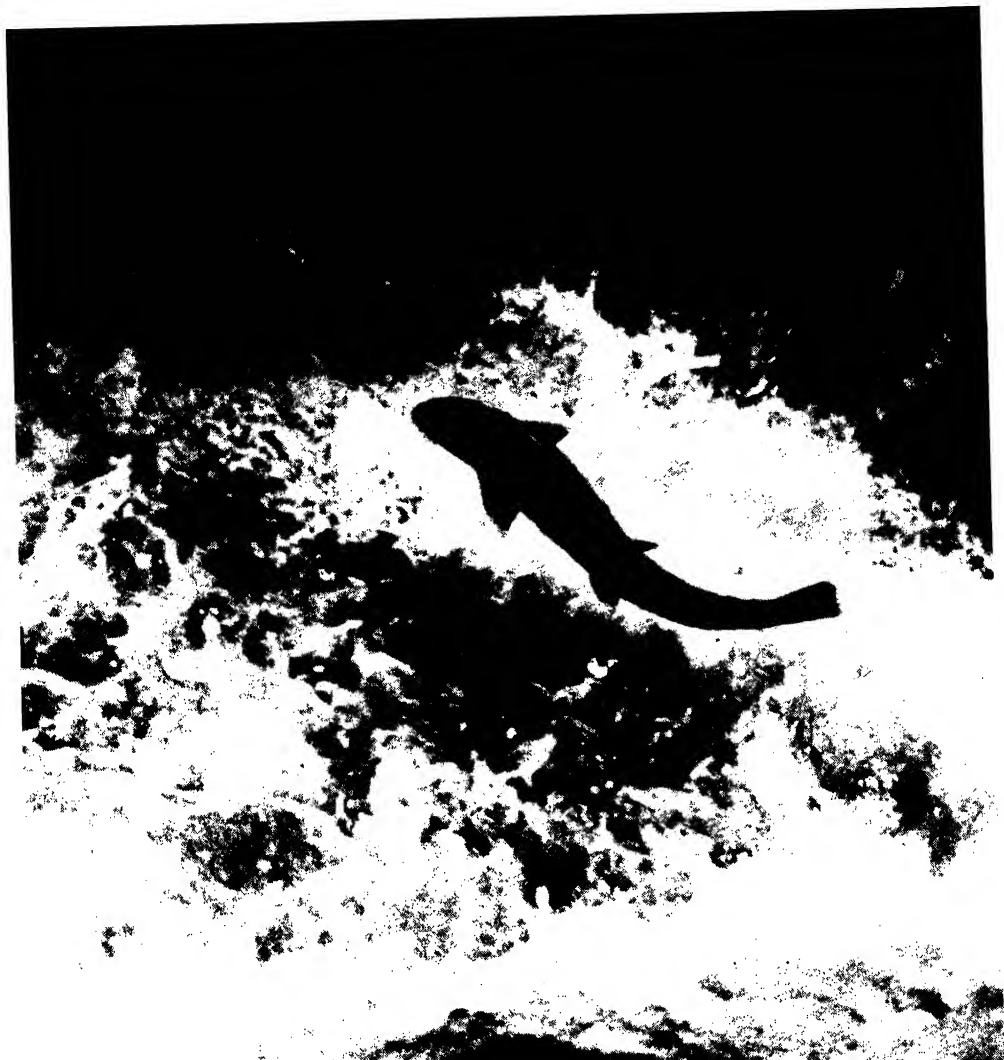
Winged insects of all kinds are abundant, though many of the earlier

kinds are now over. A number of the larger dragonflies are still on the wing during September, and various types of flies, mosquitoes and midges swarm over and around the water. Although certain caddis flies may be seen throughout the year, it is in September that they become prevalent. Caddis flies are curious moth-like insects which fly both by day and night. They are characterised by wings clothed with hairs, instead of with flattened scales like moths. Their larvæ are all aquatic, and most are plant feeders, making portable cases of various materials to protect their soft bodies. A few are carnivorous and make fixed abodes of silk web and other material. The silk strands act like a spider's web and catch likely prey as it passes, when the caddis larva rushes out from its lair and secures the already snared victim.

In some streams the crayfish may be

LARVÆ OF THE COMMON GNAT. *The eggs of the gnat are laid upon the surface of the water. When hatched the larvæ fall into the water still suspended from the surface by their breathing siphons. In this stage they can be seen twisting about.*





found in abundance in the autumn. It is of course not really a fish at all, but a crustacean; it is in fact a little freshwater lobster, and resembles the marine lobster very much in form and habits, though lacking its brilliant colouring. The freshwater shrimp is a much smaller crustacean and very much more abundant. It is found in most running water and is very prevalent in watercress beds.

It is in the autumn that eels may be met with in unexpected places—in small

streams and ditches, or even wriggling along through the grass over land in wet weather. Now where have these eels come from, and where are they going?

The answer is that they are approaching maturity and are endeavouring to return to their birth place to play their part in the perpetuation of their race. From the larger ponds and lakes where they have spent the years of their growing period, the eels make their way by ditches,



UP STREAM LEAP. *The salmon leaves the sea to deposit its spawn and leaps a weir on its way to the spawning grounds.*

where the water is three miles deep. This is the mysterious breeding place of the eels, and here in total darkness is the spawn deposited. The young spend three years in travelling eastwards again before they reach fresh water, as already described. This journey from sea to fresh water and back to the ocean is made once only, for the mature eels spawn and die in the abyss of the Atlantic.

The salmon provides a somewhat parallel case, but in reverse. In the autumn the adult salmon, which have spent their growing years in the sea, ascend our western rivers with terrific energy, leaping up rapids and falls with marvellous persistence. Their aim seems to be to get as high up as possible to the shallows of the tributaries before spawning, and it is a truly wonderful sight to watch the way they will leap through the air time after time to overcome a difficult obstacle. Unlike the eel, a salmon may return to its spawning grounds several times during its life; though some, after spawning once, appear to spend the rest of their lives in the sea.

Winter

The condition of freshwater life during the winter depends on the temperature. When the weather is mild and open it is surprising how many aquatic creatures may be found active in December or January. A hard frost, however, sends most living things down to the mud at the bottom, where they remain in a state of suspended activity until the cold spell is over. A layer of ice acts as a protection, and fish and many other creatures can survive unharmed beneath the ice for considerable periods. When a sudden frost occurs after mild weather in February has

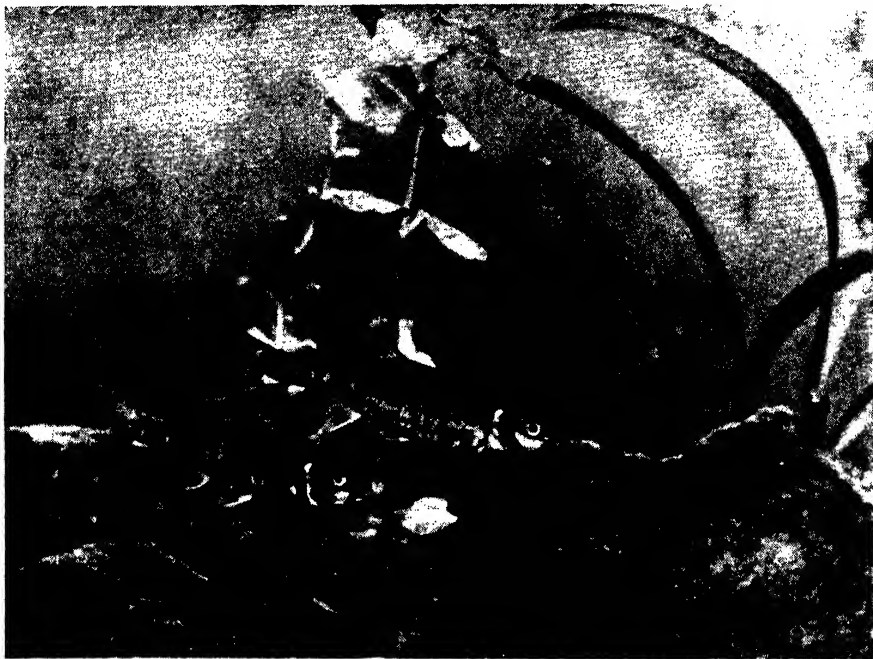
brooks, streams and rivers to the sea. In the estuaries they become gradually acclimatised to salt water, and then they enter the sea and travel westwards. Out on the hundred fathom line is the edge of the continental shelf, from which there is a steep descent to the ocean depths, and there the eels go down into the gloom; but still they travel on and on, until at last they reach an area in the centre of the north Atlantic some 3,000 miles from the British coast,

caused a resumption of activity among pond dwellers, it is often possible to see creatures such as water beetles, pond snails, or freshwater shrimps moving about under the ice.

One of the strangest of all pond creatures may be looked for during the winter months. This is the fairy shrimp,

summer, until the autumn rains form a new pool, when they hatch out into very active larvæ, curiously unlike the adults.

In conclusion, as one observes aquatic life throughout the year, it should be realised that the living beings of any piece of water—particularly a pond—form a definite community in which each



MINNOWS. *These prettily marked fish are three or four inches long and belong to the Carp family. They are distinguished from the dace and chub by their small scales. During the breeding season the male assumes gorgeous colours.*

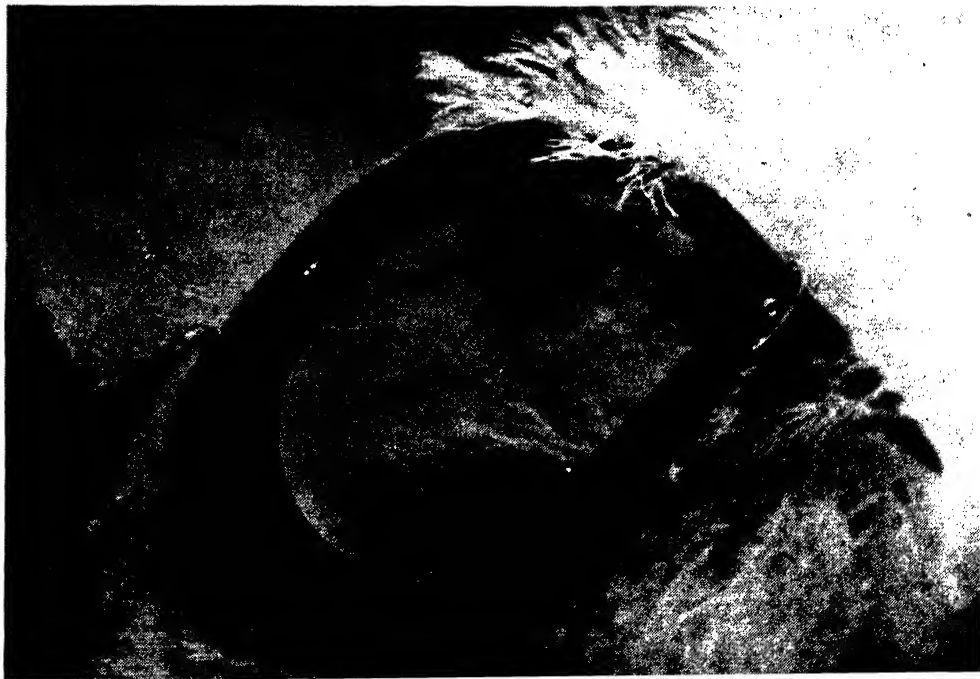
a delicate and beautiful creature which swims on its back by waving a number of feathery limbs. The animal is transparent, but of a general bluish-green tinge with red on the tips of the limbs and tail. The female carries her eggs in a special brood pouch attached to her body. This is important, because fairy shrimps are found mainly in temporary pools which dry up in summer—sometimes in mere puddles or wheel-ruts filled by the rain. In such places the protected eggs survive in the dry bed throughout the

type of organism has a special relation to the others. The plants give off oxygen and so aerate the water, while the animals absorb oxygen and give off by-products containing nitrogen and carbon which are absorbed by the plants. The plants also provide the basic food supply for multitudes of small creatures, which in turn are devoured by the larger forms, whose waste material feeds the plants. Thus the wonderful cycle of life goes on, and the balance of nature is maintained.



PIKE ON THE WARPATH. *These freshwater fish, shown above, when fully grown are sometimes as much as four feet in length and weigh thirty pounds or more.*

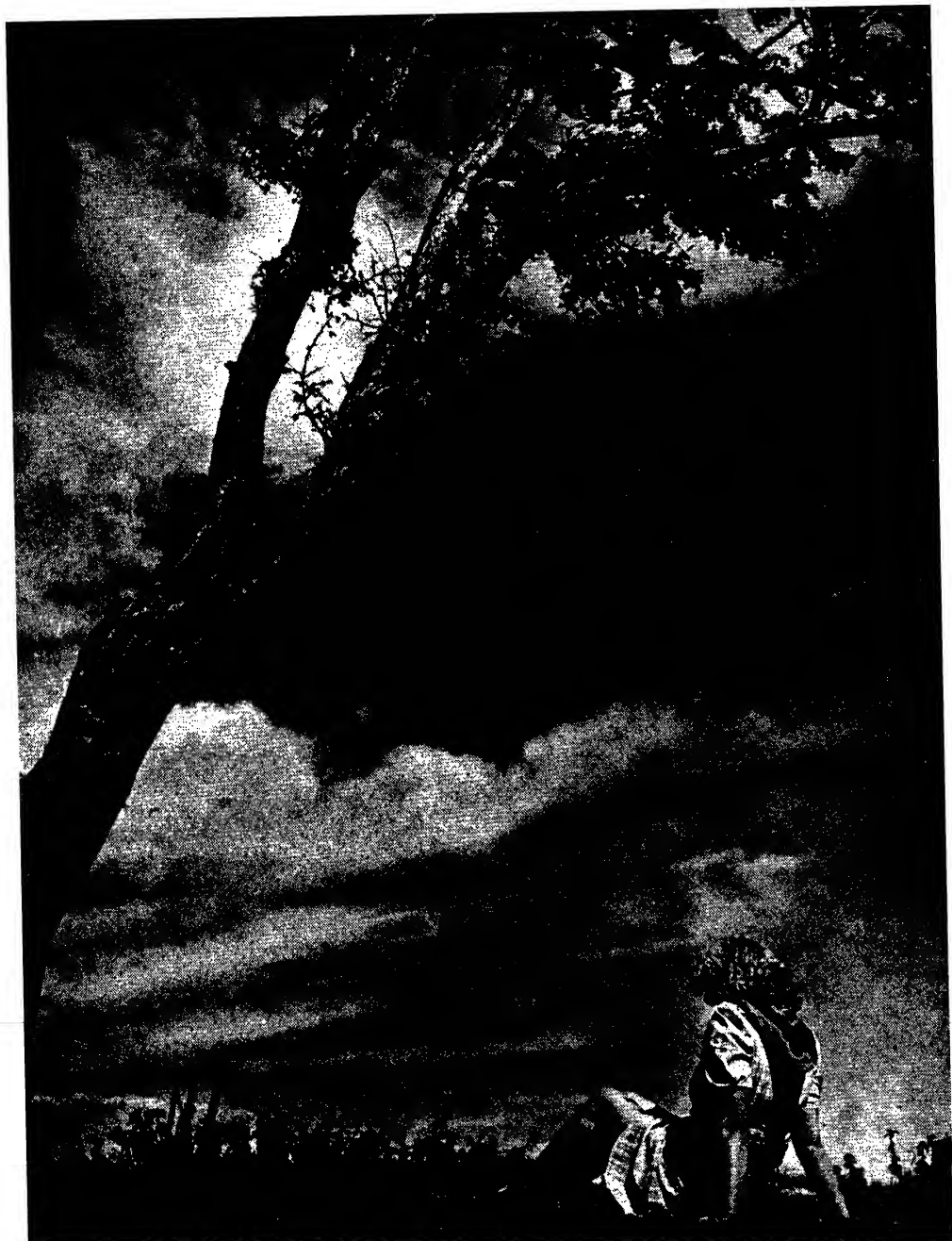
THE COMMON EEL. *These finless, snake-like fish grow very slowly. They are often to be found enjoying the sun amongst patches of weed near the surface of the pond.*







WINTER BEST COPY AVAILABLE



ON A SUMMER'S DAY. *The British countryside in summer is a feast of loveliness. It is a joy to look upon at this season, and to linger over the colourful patchwork of many coloured fields and blue or purple hills against a clear or mottled sky.*



WEATHER THROUGH THE SEASONS

"**S**HALL I compare thee to a summer's day?" asks Shakespeare in one of his sonnets. And then he adds, "Thou art more lovely and more temperate".

Our national poet obviously thought that his Dark Lady of the Sonnets was exceedingly beautiful, but he was not certain that the British weather was all that could be desired. Many of his doubts appear in his writings.

The British people and their weather are inevitably linked. We deride it, we grumble continuously about it, we suffer it (though by no means in silence) and yet we are secretly proud of it. The Britisher in an alien land thinks with nostalgia of the weather in his own country—of the autumn with its "vagrant's morning, wide and blue", of the dull, rainy days in town that can yet be beautiful when wet roofs are irradiated by sunset, of mornings of severe frost with the roads slippery and dangerous and the air as keen as a knife, and perhaps most remembered of all, the days of early spring with their urgency, exultation and joy. He also remembers summer holidays and leisurely days in

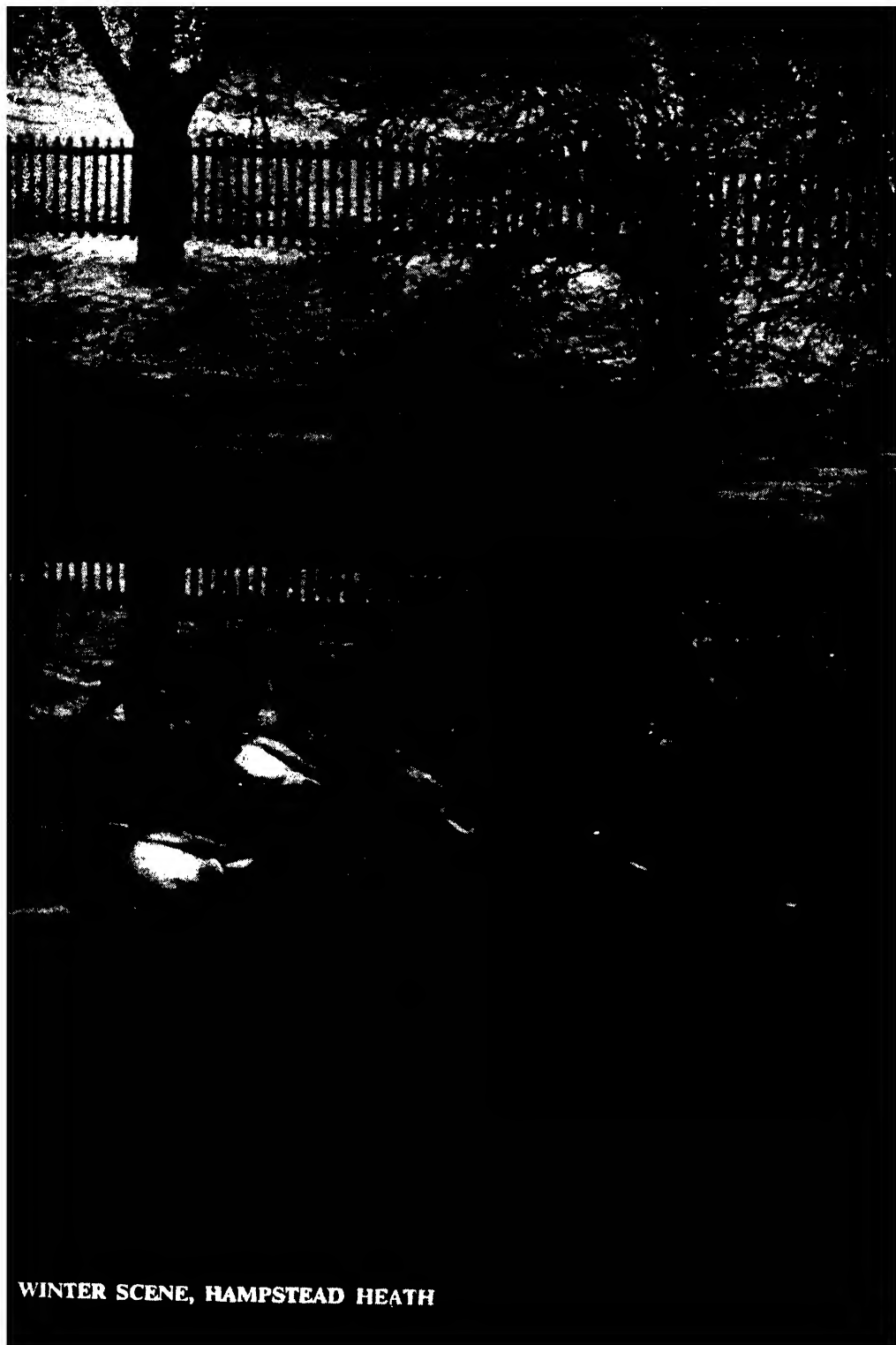
the country or by the sea—when there is time to stand and stare at the poppy-splashed cornfields, the glorious patchwork of fields, and at the wide sky, which is dappled with snowy cushions of cloud—the kind called cumulus—whose scalloped edges against the clear blue give them a story-book appearance of improbability; such clouds might well support the turreted castle in the air that children love to dream about.

On such a day, one feels so thankful for the beauty around, that it is well to consider the subject of British weather, to find out why it is so unpredictable, and to wonder whether it has not for centuries been badly maligned.

For Britain enjoys a temperate climate, neither too hot in summer nor too cold in winter for the endurance of the average person. It is spared the extremes of temperature met with upon the continent of Europe, as these islands are entirely surrounded by water, and water retains the sun's heat very much longer than land does. Edinburgh and Moscow, for instance, lie in the same latitude, but though the Scottish capital may experience some bleak weather, it never







WINTER SCENE, HAMPSTEAD HEATH

knows the rigours of a typical Russian winter. Even so, the sea to which we lazily listen on this sunny afternoon, would become ice-bound in midwinter if it shared the temperature of other waters in the same latitude, and the reason for the fact that our winter mean temperature is 30° F. above the average for our latitude, is ascribed in part to the influence of the Gulf Stream. Ocean currents are largely due to winds, and the warm tropical waters of the northern Atlantic are driven westward by the steadily blowing N.E. trade winds, in a strong current, part of which enters the Gulf of Mexico and part moves north-westwards outside the Bahamas. That part which enters the Gulf of Mexico returns to the open ocean through the Straits of Florida as a swiftly moving stream with a temperature of about 80° F. Off the Banks of Newfoundland, it divides into three branches, the main one of which becomes the North Atlantic Drift and reaches the western coasts of Britain and Norway. By that time, its velocity has fallen to less than two miles per day, and its temperature to between 45° and 50° F. in winter and 55° and 60° F. in summer, round the shores of our islands.

The South-West Winds

More important than the Gulf Stream in its influence upon our climate, however, are the prevailing, warm, south-westerly winds which drive the waters of the Gulf Stream before them. These winds are more strongly developed in winter than in summer, and this fact explains the great frequency of gales from the south-west on our coasts in that season.

Perhaps, if we examine the British weather month by month, we may find it easier to understand. First of all, we must remember that by the term "spring" meteorologists mean the period covered

by the months of March, April and May; summer embraces the months of June, July and August (July being the month of the greatest heat); autumn covers the months of September, October and November, and winter, December, January and February. It is customary to calculate the averages of temperature, rainfall and sunshine and other weather data over a long period and thus arrive at a mean value for each month.

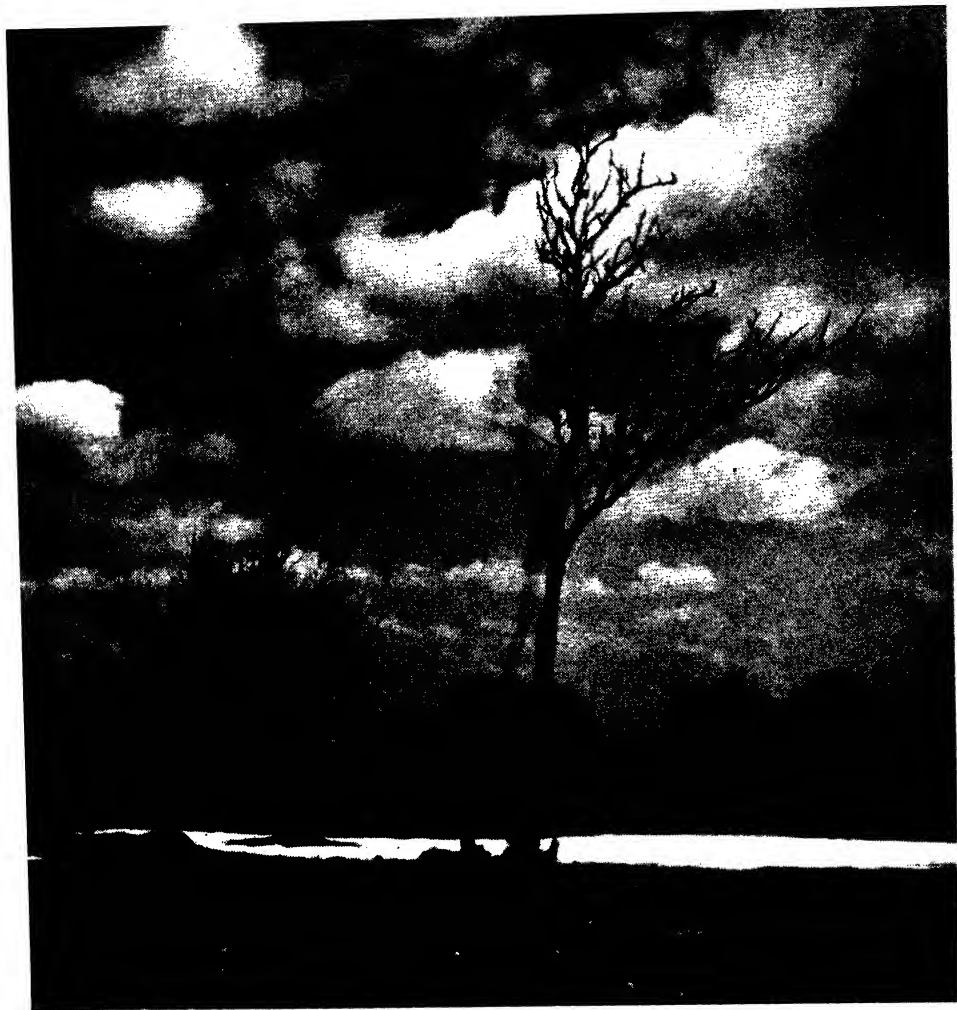
January Snowdrifts

January is the coldest month of the year, although, until a few years ago, the old-fashioned Christmas-card type of winter with its heavy snowstorms, whereby traffic was interrupted and towns isolated, had become a more or less legendary thing.

We seem to be hearing of another world when we read passages such as the following from Charles Dickens' *A Christmas Carol*:

"Meanwhile the fog and darkness thickened, so that the people ran about with flaring links, proffering their services to go before horses in carriages and conduct them on their way. The cold became intense. In the main street at the corner of the court, some labourers were repairing the gas-pipes, and had lighted a great fire in a brazier, round which a party of ragged men and boys were gathered, warming their hands and winking their eyes before the blaze in rapture. The water-plug being left in solitude, its overflows suddenly congealed, and turned to misanthropic ice. The brightness of the shops where holly sprigs and berries crackled in the lamp heat of the windows, made pale faces ruddy as they passed. . . ."

The winters of 1940-41 and 1941-2, however, were certainly winters of the old-fashioned type, both as regards degrees of cold and persistence of snow.



WINTER SCENE. *Bare trees and frozen fields contrast with a beautiful sky. The wind is biting and the trees dead and bare. In the plant world all is still. The creatures of the woodland and the hedgerow are hibernating until the weather is warmer.*

though these winters were followed by the mild and open season of 1942-43.

It may come as a surprise to most people to learn that the mid-winter temperature is just as low in London as in Shetland. In January, the whole region from the Shetlands through north-east Scotland, north-east England, the east Midlands and down to the Thames estuary, shares a mean tempera-

ture below 40° F. As we go westwards, it becomes warmer—north-west Scotland to north-west England, north-east Ireland, Wales, and southern England having temperatures between 40° and 42° F., while north-west, west and south Ireland, Carnarvon, Pembroke and Devon have between 42° and 44° F., and a few outlying places on the Connaught and Munster coasts, as also the

seaward tips of Carnarvon and Pembroke and the westerly half of Cornwall, have between 44° and 46° F. The warmest place in winter is the Scilly Isles, with a temperature of almost 47° F. That is to say that the west of our islands in winter is about six degrees warmer than the east. But by April the warmth is distributed differently, north Scotland having about 44° F. while south England has about 49° F. By midsummer still further changes have taken place, and there is a south to north fall of temperature of about eight degrees.

The explanation of the difference between the winter and summer distribution of temperature is to be found in the greater amount of sunshine received in summer over south England, and in its proximity to the Continent from which it is separated by the narrow

Channel waters, while northern Scotland is widely separated from the European land-mass.

The Anglo-Saxons called the month of January Wulfmonath, because hunger then made the wolves bold enough to come into the villages.

It is said that if the weather is fine and frosty at the close of January and the beginning of February, we may look for more winter to come than we have seen up to that time. Usually, the month of February is associated with rain, the old adages, "February brings the rain" and:—

"February fill-dyke, be it black or be it white

But if it's white it's better to like" reminding us that in the old days rain and melted snow filled the ditches to overflowing. The wettest month in

FEBRUARY FILL-DYKE. *The melting snows flood the fields and overflow the ditches. Such saturation of the earth is of great importance at this time of the year as the life giving moisture penetrates far below the surface, feeding the seeds below.*



England, however, is October, but for all the other parts of the kingdom it is December. Oddly enough, the driest month in England is April, in Wales it is May, and in Scotland June, though in Ireland April and May are equally dry. Though rainfall is so variable in its quantity and the time of its fall, yet in all parts of our islands there is agreement that the first six months of the year are less wet than the last six months.

Rain can be classified, to some extent, into three groups: the first is caused by moist air being forced upwards over a hilly region by the wind and is called "orographic" rain; the second, called "depressionary" rain, falls when the warm moist air is forced upwards by the cold air mass in a depression; and the third, "thunderstorm" rain, is due to local and intense convection (the transfer of heat upwards).

Spring Showers

The first type of rainfall depends on the presence of mountain-masses, and its locality is therefore fixed, but generally speaking, it is not possible clearly to separate the three types. What is very important, however, is the profound influence of high ground on the distribution of rain. If we look at a physical map of our islands, showing the contours, and then at one showing rainfall contours, we cannot fail to note their similarity. Where there are mountains or other high ground on the one map, there are areas of heavier rain on the other. All the western half of Scotland gets more than the normal average rainfall of our islands, while in England and Wales there are three regions showing a similar excess, the Pennines from the Lake District down to The Peak in Derbyshire, practically the whole of Wales, and Cornwall and the Exmoor and Dartmoor districts of Devon. In Ireland, sometimes compared in shape to a saucer, the same

"high ground" influence produces a border of excess rainfall almost round the country.

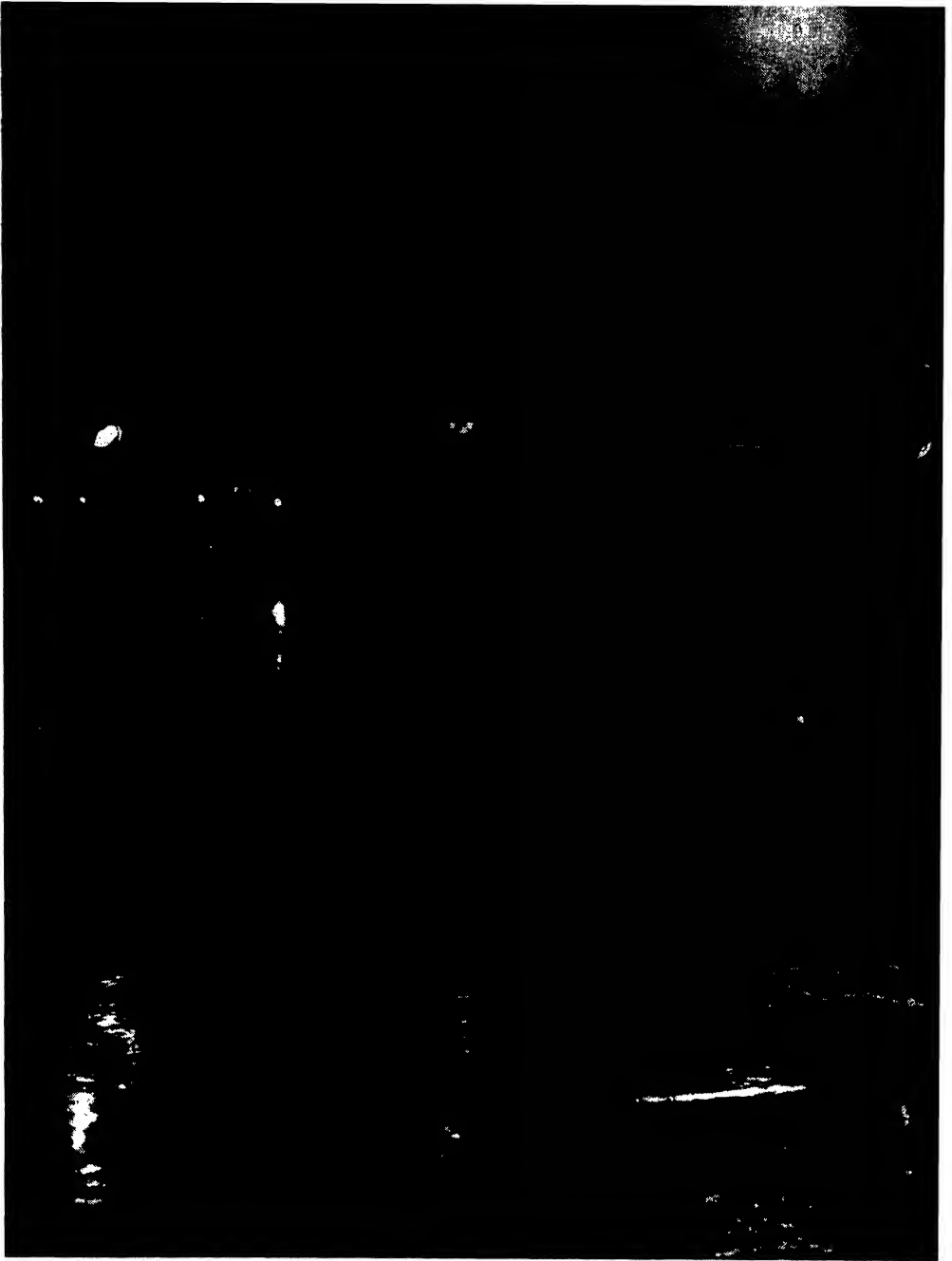
The Anglo-Saxons called March Hlydmonath (loud or stormy month) or Lencten-monath (lengthening month) because the days then rapidly become longer. Sir William Watson addressed a poem to April which began:—

"April, April,
Laugh thy girlish laughter;
Then, the moment after,
Weep thy girlish tears!"

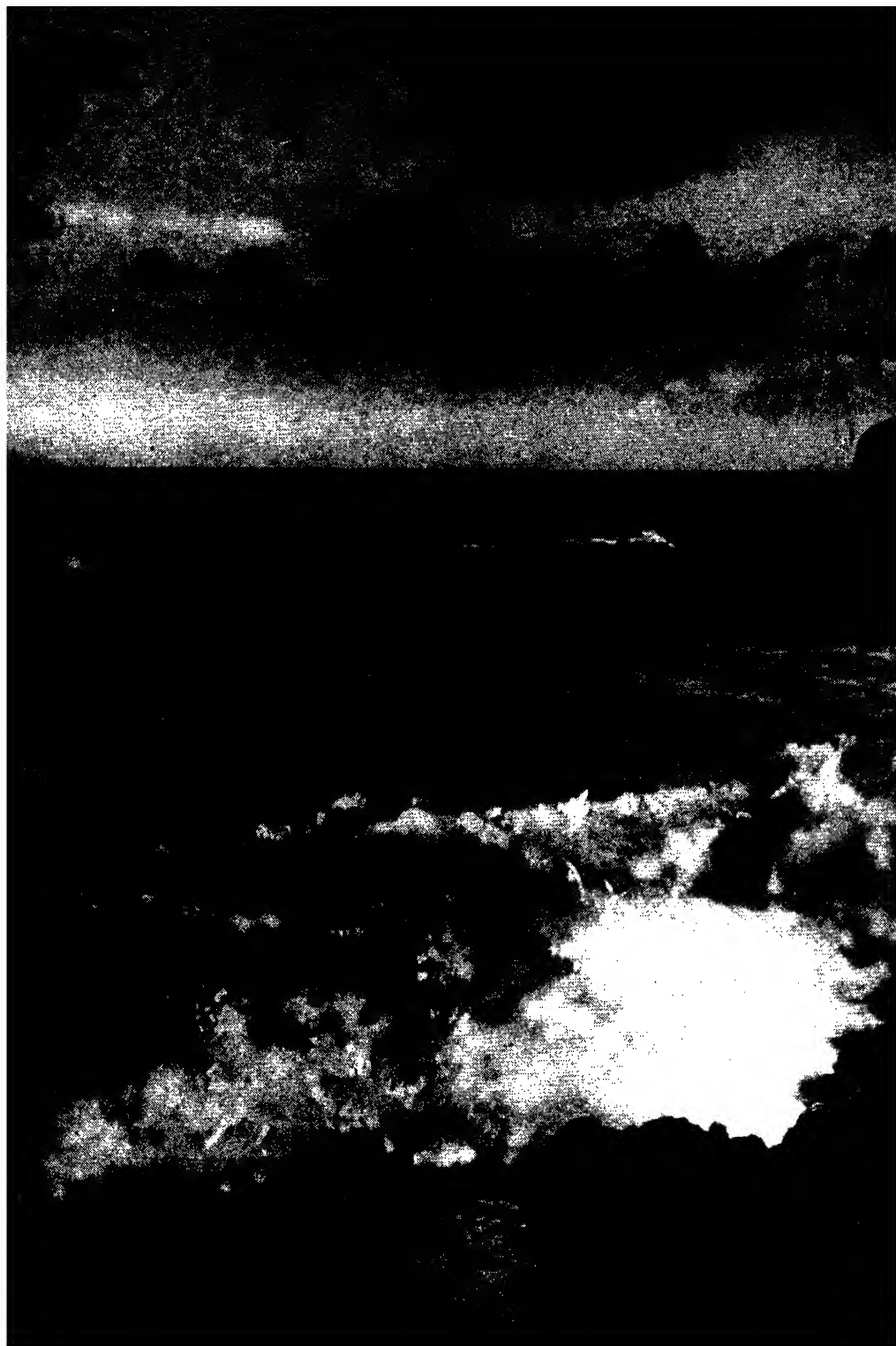
Actually, this is a perfect description of March weather, for it is essentially a month of alternate laughing and crying—there are hours of sunshine followed by wild winds and heavy rain. March says farewell to winter and ushers in the spring. March can charm with its tenderness, or pursue, as it so often does, an inflexibly wintry course, regardless of the calendar. Shakespeare recorded that "Rough winds do shake the darling buds of May" and many an orchard shows in its withered pear blossom the effect of a late frost's chilly touch; but interspersed with the last out-riders of winter come days when the English spring more than justifies all the praises of the poets. Days when warm breezes blow softly from the south.

The countryman requires dry windy weather to ensure good crops—hence the sayings "A bushel of March dust is worth a king's ransom" and "March dust to be sold worth ransom of gold". These originated in the far-off days when the fine for murder was proportionate to the rank of the person killed, the lowest fine (for a churl) being £10 and that of a king, which was, of course, the highest, being £60.

It is during March that an auroral display may take place, as the most likely time for such occurrences is at the equinoxes, in March and April, September and October.

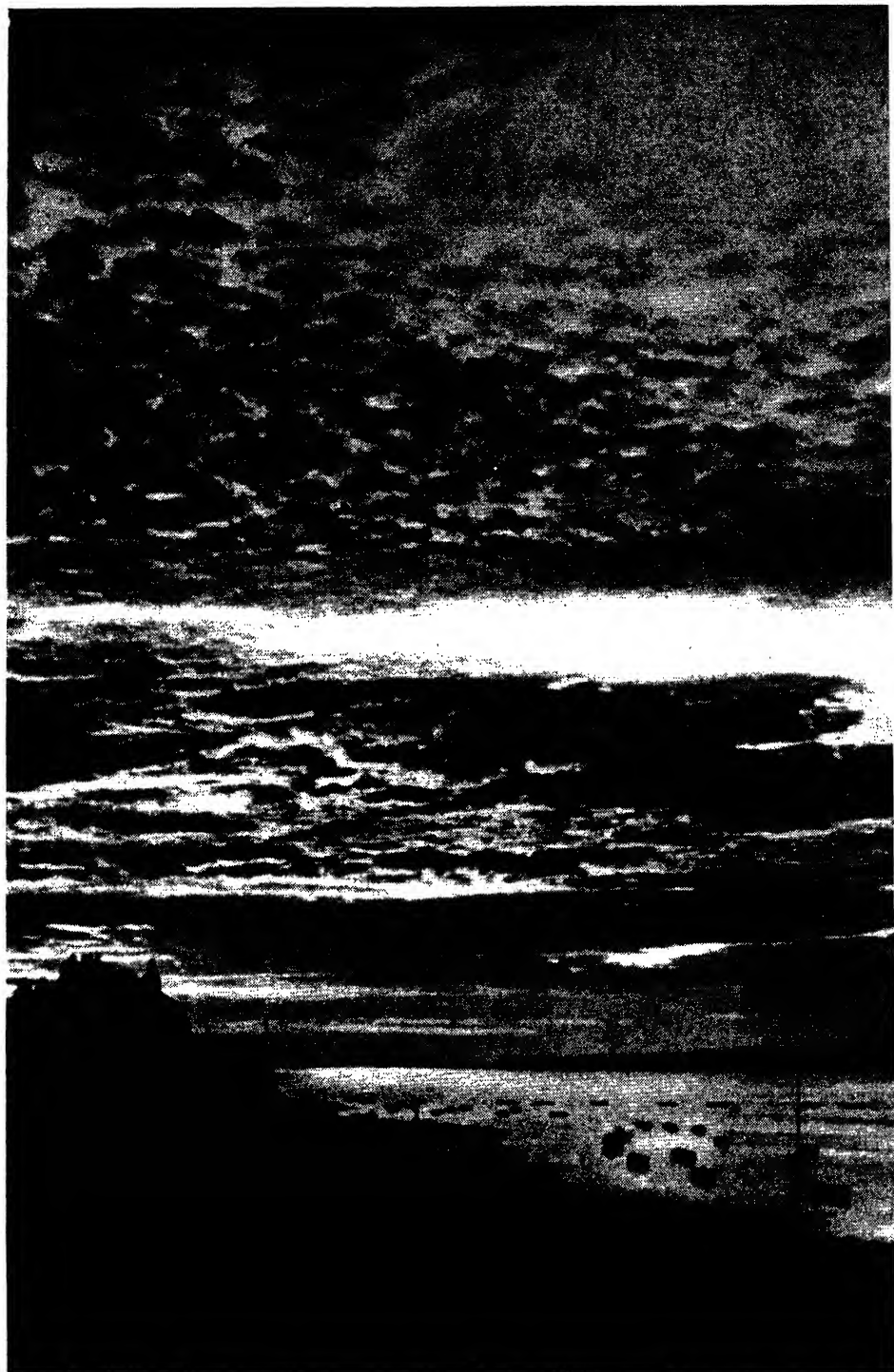


NATURE'S BLACK-OUT. *Fog is caused by moist air in contact with the cold ground or water. Over industrial areas the fog is surcharged with smoke and dust and visibility is hindered and traffic disorganized over a considerable distance.*





ROUGH SEA, BASS ROCK





STIPPLED SKY. *This striking cirrus cloud effect is intensified by the colours brightly reflected from the setting sun.*

occur about twice as frequently on the west coasts of Ireland as on the east coasts of England, and such exposed places as Scilly, Donegal and Butt of Lewis. Gales blow chiefly from points between S.W. and N.W. on our west coasts, but also from S.E. in north-east Scotland.

April Showers

The derivation of the name "April" is uncertain. Tradition says that it comes from the Latin word "aperire", to open, which certainly seems suitable as it is the season when buds and flowers shed their protective wrappings and emerge in all their beauty.

Sudden showers fall in this month. "April's anger is swift to fall, April's laughter is worth it all" says Henry Newbolt, and indeed the newly washed countryside is glorious after a sharp downpour, especially if there is a rainbow to follow. This is seen most often in the late afternoon, when the sun is getting low in the heavens and the heavy shower-clouds are beginning to dissolve. The rainbow is sometimes seen double, the inner or primary bow being brighter: and the inner one shows the red on the outside, while the outer one shows red on the inside. The bows are caused by rays of sunlight falling on the raindrops and being reflected from them, at the same time being refracted both on entering and on leaving the raindrop. The colours of the spectrum—red, orange, yellow, green, blue, indigo and violet—are reproduced in the rainbow, but sometimes beyond the violet edge is displayed a series of bands alternately pink and bluish-green; these usually come and go with great rapidity, but if they are looked for carefully they may certainly be seen, even though fleetingly.

Not many people know that it is possible to see rainbows in moonlight, though then the colours are as a rule very faint. The old fable tells us that the person who reaches the spot where the rainbow touches the earth will be sure to find a pot of gold. Thus day-dreamers are sometimes called rainbow-chasers because of their habit of hoping for the impossible.

One of the charms of the month of April is that you may expect to meet with almost any one of the conditions found in any other month of the year. Shakespeare refers to "the uncertain glory of an April day" and it is true that frost, snow, gales, thunderstorms, and the hot sunshine of summer are all to be encountered within these thirty days of opening buds and singing birds, sporting lambs and green grass. It is then that the poplar and willow catkins are profuse, and we are all familiar with the Common Goat-willow, better known as "Palm" because its branches were carried in processions on Palm Sunday and used to decorate the churches on that day.

May Day Festivities

May Day was a great public holiday in mediaeval and Tudor England, when everybody rose with the dawn and went "a-maying", bringing back great branches of trees and flowers to their villages.

The typical wild flower of this month is the "May" or hawthorn, and the countryside at this time of the year is teeming with plant and animal life of every kind.

"March winds and April showers
Bring forth May flowers"

runs the rhyme. The coming of May is hailed as the gateway to summer and often brings a heatwave, though "Cast not a clout till May is out" for, more than in any other month, extremes of temperature may be met. In May,

1944, for instance, there was a minimum temperature of 14° F. and a maximum of 91° F. This is nearly twice the annual mean range of temperature. On the only two previous occasions when the temperature has reached 90° in May in the shade, it has failed to reach 80° on any other day in the whole year.

There are many old rhymes about the attributes of May, such as

"Cold May and windy
Barn filleth up finely"

and

"A swarm of bees in May
Is worth a load of hay.
A swarm of bees in June
Is worth a silver spoon.
A swarm of bees in July
Is not worth a fly".

The poets, too, have not forgotten this month and its flowers, one of the loveliest descriptions being that of John Keats:—

"And mid-may's eldest child,
The coming musk-rose, full of dewy
wine".

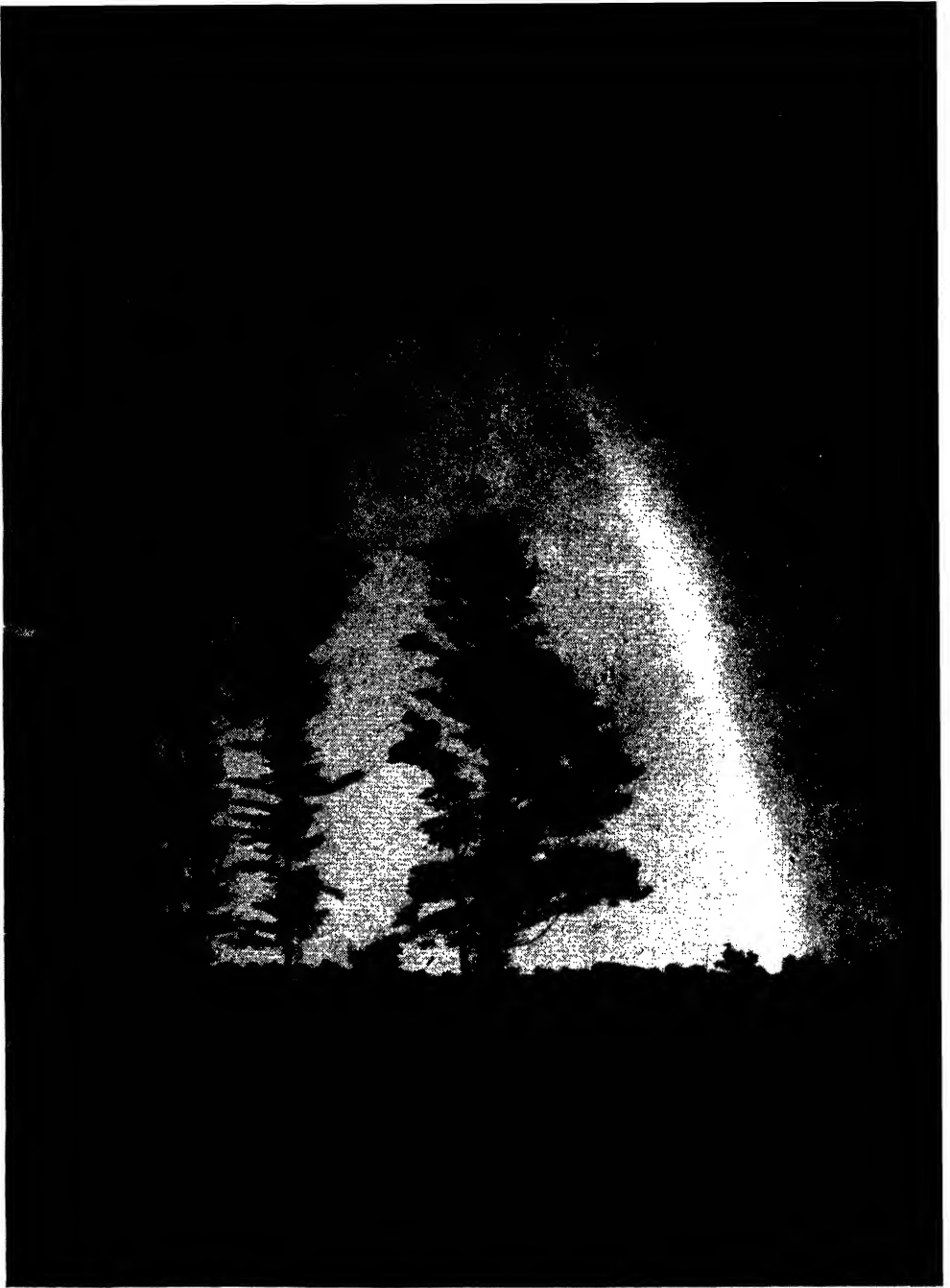
The scarlet pimpernel is very plentiful this month and is known as the peasant's weather-glass and also as the poor man's warning, as it closes its petals at the approach of rain. In one of his lighter moments, Dr. Jenner, the man who first successfully practised vaccination, is inspired to compose verse about this flower:—

"Closed is the pink-eyed pimpernel:
'Twill surely rain; I see with sorrow
Our jaunt must be put off to-morrow".

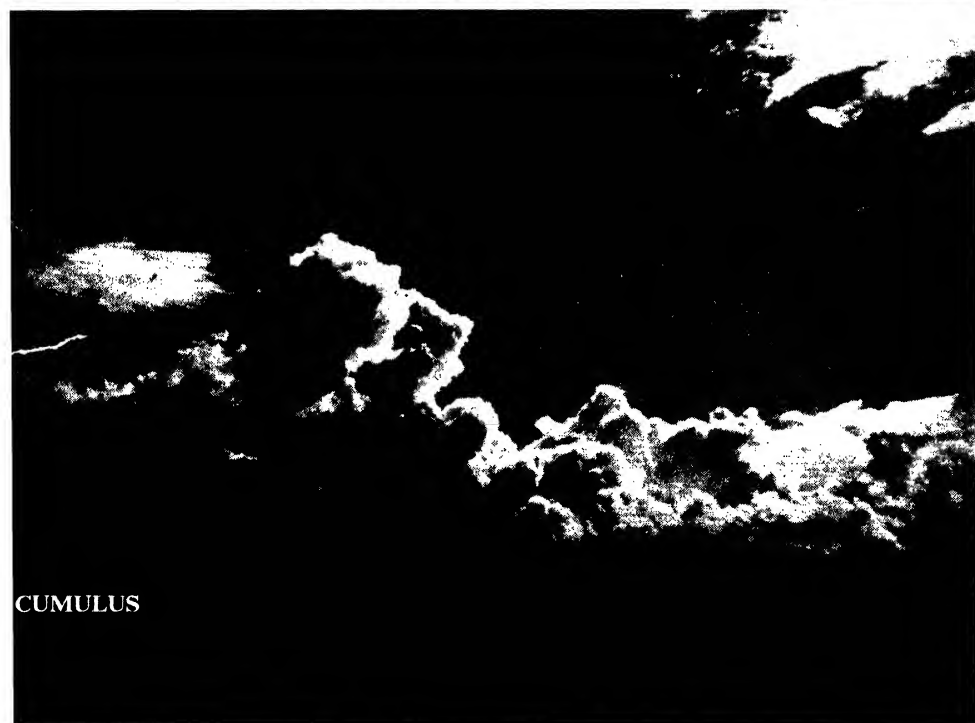
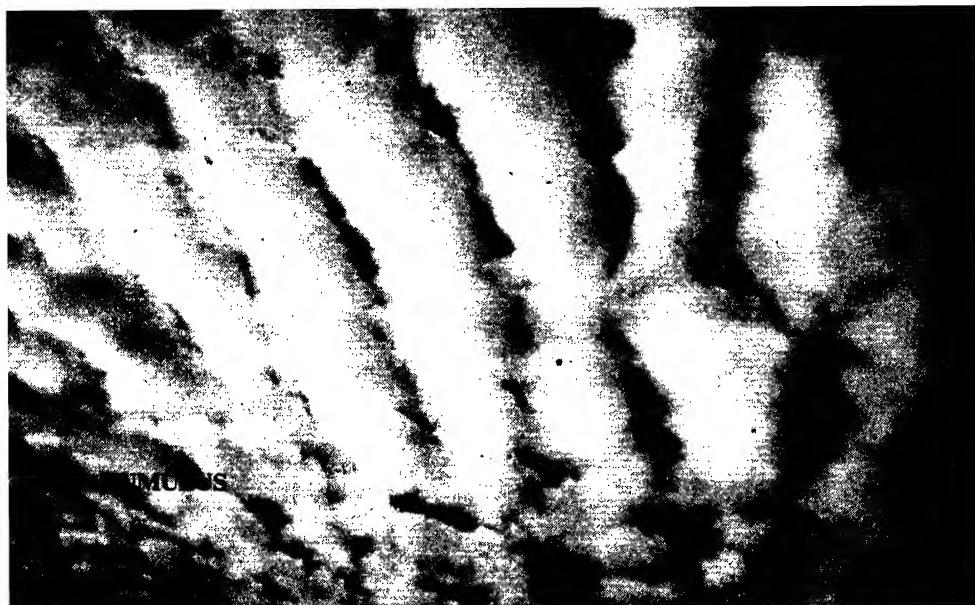
The wren, chaffinch, robin, blackbird and nightingale sing continuously in May, and the description of the cuckoo—"In May, he sings all day" is very true.

Lovely skies may be seen in May and we have all heard the adage:—

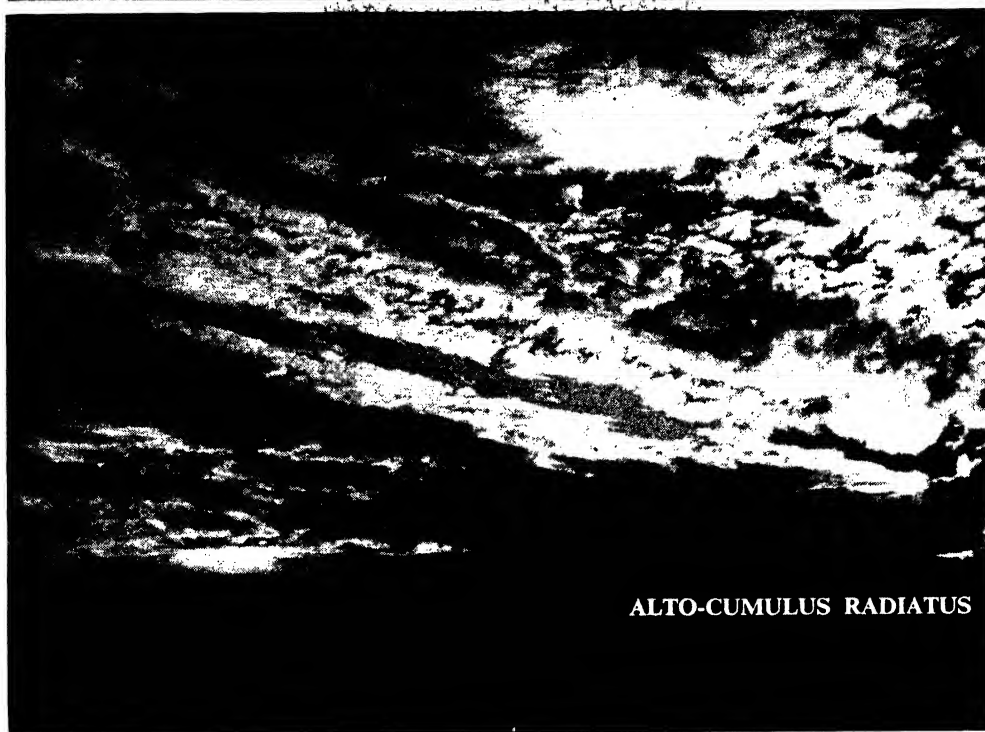
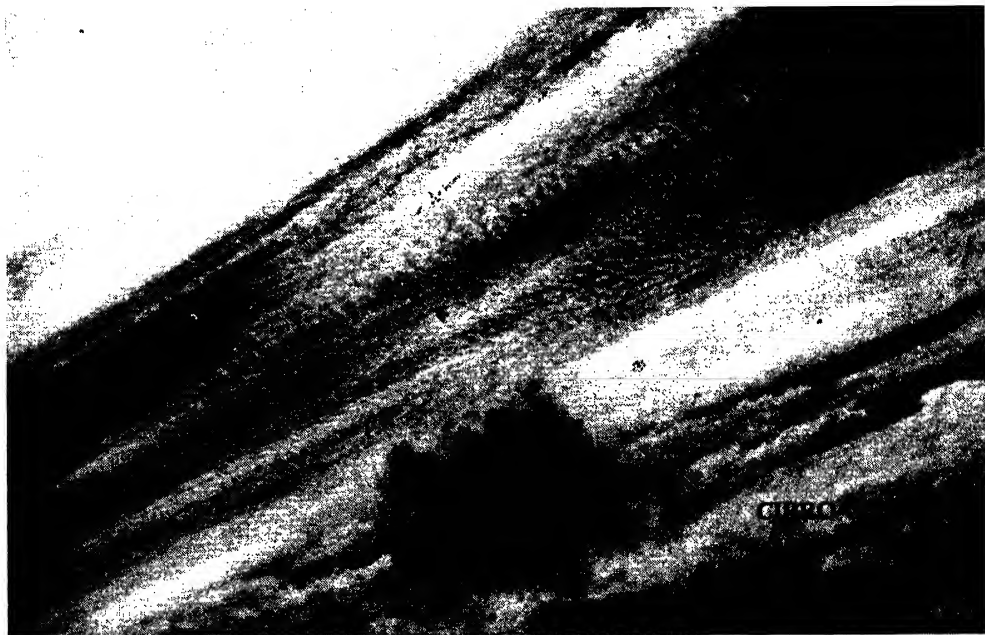
"Red sky at night, shepherd's delight,
Red sky at morning, shepherd's
warning".



THE RAINBOW. *After a sudden spring shower the full glory of the rainbow, showing the seven colours of the spectrum, is often seen. There is a legend that a pot of gold may be found at the spot where the rainbow touches the earth.*

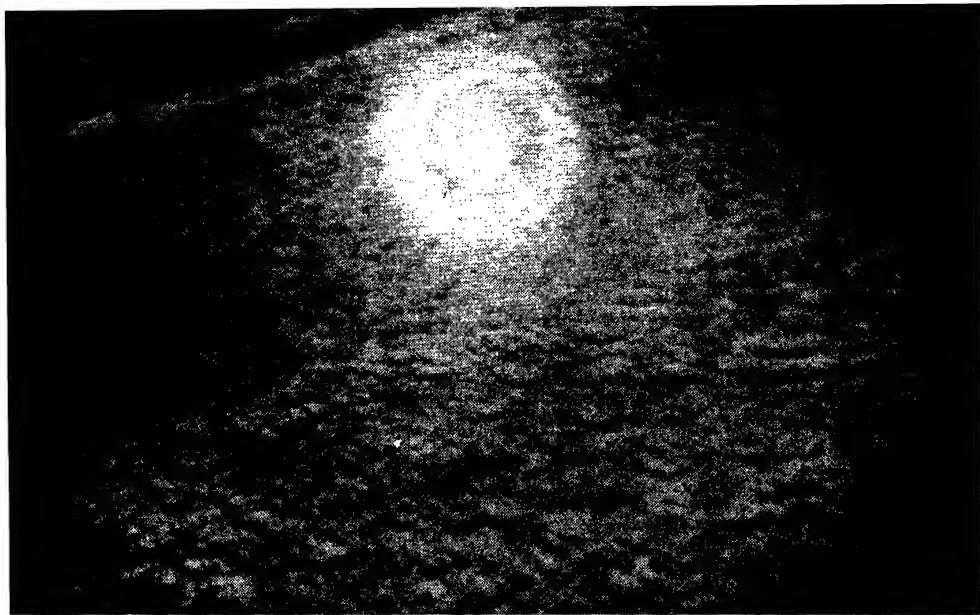


CLOUD FORMATIONS. *On these pages are shown four of the most beautiful types of cloud formation. The Alto-Cumulus is composed of small globules grouped in serried ranks. Cumulus is the common cloud heap of a normal summer day.*



ALTO-CUMULUS RADIATUS

Cirro-Cumulus, seen particularly at sunset, is a perfect rose-pink of tiny globes and wavelets arranged in delicate network across the sky. Alto-Cumulus Radiatus is another form of the alto-cumulus broken into bands by a second wave system.



HALO ROUND MOON AND SUN. *In the top picture a perfect example of the halo can be seen round the moon. The lower photograph shows the upper part of a ring around the sun. Both phenomena are caused by light-refracting cloud formations.*

Cloud patterns can be intensely beautiful, and even the casual observer is aware that clouds are of different kinds, some being light in texture, others heavy and massive, some are high in the heavens while others float round the summits of low hills. In fact, though their types number about a dozen, their variety is unlimited. The highest clouds are found at a level of about 30,000 feet, where the temperature is far below freezing-point, and above which no further fall of temperature occurs. These highest clouds are of a delicate and wispy formation, called Cirrus. They are often the first clouds to appear after a spell of fine cloudless weather, and can be seen moving from some westerly point in orderly threads ending in little tufts, gradually increasing in quantity until they fuse together into a veil of nearly uniform white, which though it may cover the sun, does not cut off its entire strength but diffuses the light.

Clouds from Ice Crystals

This cloud-layer is called Cirro-stratus, and like Cirrus it is made up of ice-crystals, as might be expected from the severe degree of frost existing at their level. A thickening of this layer develops the type of cloud called Alto-stratus which, found at a much lower altitude, is featureless and undistinctive. Among the most beautiful of all cloud-forms is Cirro-cumulus, which is a blend of Cirrus threads with tiny globules and wavelets, sometimes arranged in a delicate network over the sky, and especially striking when seen at sunset, pink and gold against the blue heavens. At a lower altitude the waves and globules are larger, but whether high or low their essential character is one of extreme orderliness, and has earned for them the popular name of "mackerel" or "dappled" skies.

The commonest cloud-form appears generally as a sheet of light or dark

grey cloud of irregular shape, loosely grouped in rounded masses. This is known as Strato-cumulus. Closely related to it is Stratus, which is merely a lifted fog.

A common sight in the sky, arising out of the refraction of light from ice-crystals in the atmosphere, is the halo round the sun or the moon, a ring of silvery light faintly tinged with reddish-orange on the inside. Unless the sun is high enough in the sky, only the upper part of the ring will be seen: in fact, the halo is more likely to be seen in winter round the moon, because the cloud in which it is formed is usually a herald of bad weather such as occurs more often in winter than in summer, also the moon is high in the sky in winter-time and the halo is more easily discerned round the moon.

There are several other appearances to be met with, besides this type of halo. One is known as the "mock sun ring"; this is a pure white circle parallel to the horizon running right round the sky through the sun; on it, at a point diametrically opposite to the sun, is a bright spot known as the counter-sun. All these appearances are produced by reflection of sunlight from the surfaces of ice-crystals. Reflection of light from ice-crystal surfaces also produces another effect; the sun-pillar, a vertical column of brilliant light stretching upward from the sun. It is best displayed at sunset when, as the sun sinks, the pillar of light changes to gold and red.

June derives its name from Iuniores, the month which the Romans used to dedicate to youth. This month is often referred to as "Flaming June" because of the burning vividness of the beauty which may be found in abundance—butterflies and birds, wild roses, climbing honeysuckle, golden gorse and broom, and the glorious song of the nightingale. It is not surprising that for centuries

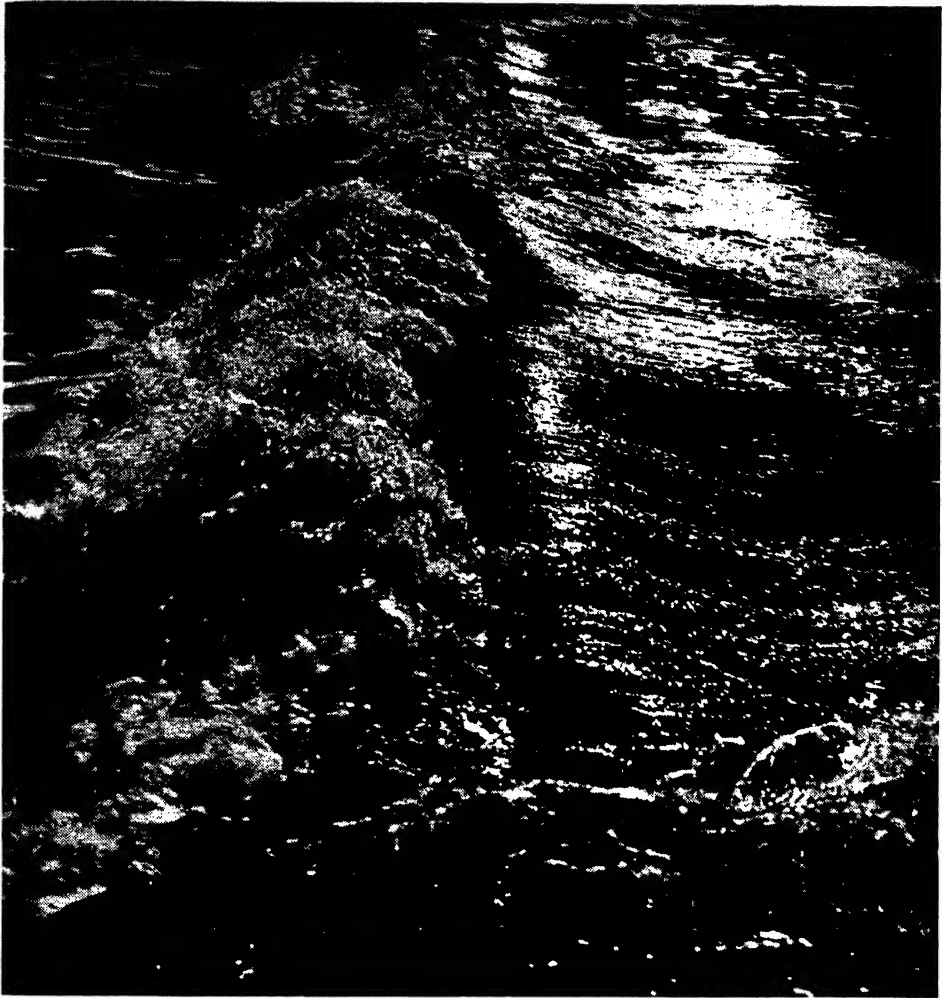




STORMY WEATHER



CUMULO-NIMBUS. *This type of cloud with a large anvil is usually a thunder cloud. It is an all too familiar sight in the British Isles during the short summer months..*



SUNLIGHT ON THE BREAKING WAVES. *A typical sight on a summer's evening are the gold tipped sea waves breaking into snowy foam as they roll towards the shore.*

it has been considered lucky for marriages, and that a June union was thought to be "Good to the man and happy to the maid". With the coming of June, the perfection of an English summer day may be looked for, with skies of misty blue thinly veiled with wisps of far-off cloud, when the sun shines with uninterrupted warmth and brilliance for anything up to twelve hours, according to the district. At this

season, when evenings are so long that they merge almost imperceptibly into night, and even the hours of darkness are warm with the breath of summer, the weather of Britain shows itself at its best—and its best, most travelled British people will roundly affirm, is second to none in the world. If one is lucky enough to have such lovely weather while on holiday in the country or by the sea, the question often arises:—



Why is it that we get so much sunshine here in the country while in London the sun is seen so much more rarely?

The answer is that the amount of sunshine recorded anywhere depends upon the amount of obstruction of the

passage of the sun's rays. Clouds form the major obstruction, but fog and smoke pollution in the industrial areas also have a share in reducing the amount. Taking our islands as a whole over the whole year, about two-thirds of the sunshine



WIND AND SAIL. *The strong winds blowing across flat low-lying ground make a perfect yachting centre of our beautiful inland broads and waterways.*

equally divided; considerably more is recorded along the Channel coast than is received in the Manchester region or in the Highlands, and as a rule, more sunshine is recorded on the coast than inland.

The effect of hills and industrial smoke pollution is evident from an inspection of all sunshine record-keeping. The dull areas in Lancashire, the Midlands and Clydeside for example, are largely due to smoke; but the lack of sun in the clear unpolluted air of central and western Inverness is the result of condensation in the air, caused by its having to rise over the high ground. This is illustrated by the Island of Skye, where, even though the surrounding heavens are blue and unclouded, the summits of the Cuillin Hills may often be seen shrouded with cloud, when a warm moist wind blows in from the sea. Then, too, many a climber has arrived, somewhat exhausted but triumphant, at the summit of Snowdon, to find that the marvellous view over the surrounding country which he had been promising himself is out of the question, as it is impossible to see even a few yards in front of his face, owing to the heavy clouds.

we should receive is obstructed and about one-third allowed to shine. That is to say, we receive only about four hours out of twelve hours of sunshine we might expect on the average day throughout the year, but this is not

The amount of possible sunshine at any place depends on the length of time between sunrise and sunset at that place, and that varies with the season and the latitude; for example, in the Shetlands, the summer duration of possible sunshine is $18\frac{1}{2}$ hours on the 21st June, and the winter duration is $5\frac{1}{2}$ hours on the 21st December, while in the English Channel the possible corresponding durations are 16 hours and 8 hours respectively. It will be seen that the English Channel has a double advantage,

since in the far north the summer time advantage of longer duration is offset by a lower sun, with less power to heat.

The longest day of the year occurs about June 21 or 22, and this day marks the official beginning of summer. This is the day of the summer solstice, the winter solstice being on or about 21 December. In astronomy, the solstice is either of the two points at which the sun reaches its greatest declination north or south. The term solstice is also applied to the time at which the sun reaches the point thus defined, i.e., June 21 or December 21.

The Anglo-Saxon term for July was *Heg-monath* (hay month) or *Maed-monath* (mead month), the meadows being then in bloom. July is the richest of all months for wild flowers and over 700 blossom at that time, yet even so, signs of the passing of summer are most noticeable. The blackbirds, wrens, thrushes, and pipits cease to sing; the cuckoos call no longer and many actually leave the country. Dragonflies, wasps and bees are abundant, however, and most of our finest butterflies appear at some time during this month.

Legend of St. Swithun

St. Swithun's Day falls on 15th July. This saint was a ninth century Bishop of Winchester, adopted as patron. According to contemporary writers, when St. Swithun's body was transferred from its almost forgotten grave to Ethelwold's new basilica on 15 July, 971, miracles accompanied the translation. A mass of legend and literature grew around the name of St. Swithun with the revival of his fame. He had prayed that his burial might be "*ubi et pedibus praetereuntium et stillicidiis ex alto rorantibus esset obnoxius*" meaning "where he might be exposed both to the feet of the passers by and the rain falling from on high". This seems to indicate that the well-known weather

myth connected with St. Swithun's day had, even as early as the 12th century, crystallised around his name, but even when the meaning is strained to the uttermost, it is difficult to see how St. Swithun's prayer lends itself to the following interpretation:—

"St. Swithun's day if thou dost rain

For forty days it will remain.

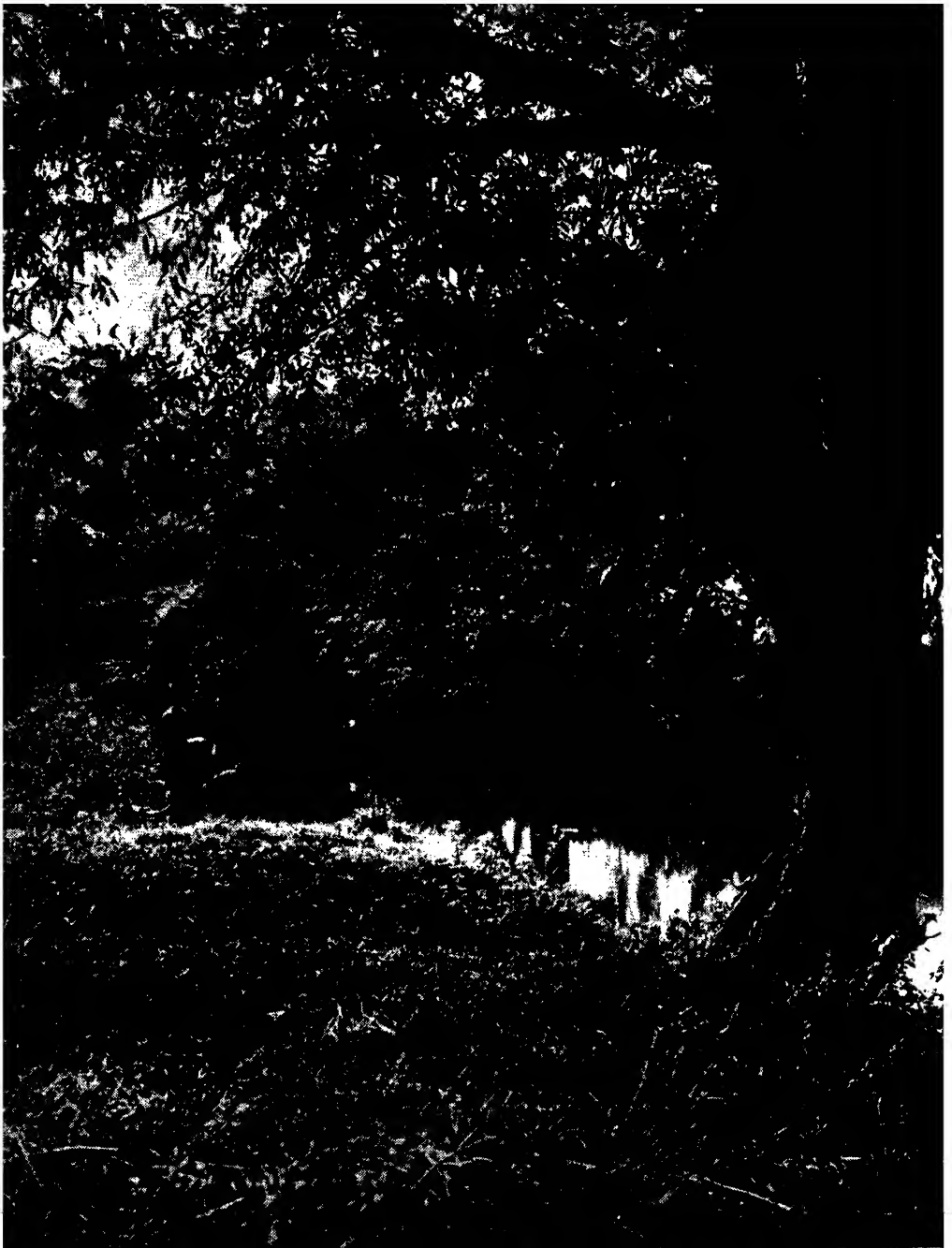
St. Swithun's day if thou be fair

For forty days 'twill rain na mair'.

The arrival of July's hot weather not infrequently brings with it a cycle of thunderstorms, and the weather must often be wet on St. Swithun's day as three days' fine weather and a storm is the cynic's description of the English summer. If such a version is not strictly justifiable, there is sufficient truth in the assertion to make it a recognisable picture of July weather.

Thunder and Lightning

Thunderstorms can be violently beautiful because of the dazzling effect of the forked lightning, especially when it is against a night sky. Thundery conditions arise when air coming in contact with ground greatly heated by the sun's rays becomes heated too, and at once rises at considerable pressure through the colder air above. The hot air is charged with moisture, and by the time the rising mass has reached a height of about two thousand feet, this moisture begins to condense and form a cloud, which may continue to rise and expand until it is four or five miles up and stretches across many miles of country. The rain which falls from such a height, and from such a huge mass of cloud, must naturally be very heavy. At the great heights to which some thunderclouds rise, some of the water-vapour turns directly into ice, and the resultant fall is of hail. Occasionally, the ascending currents of air within the cloud are so powerful that the falling hail is once



A SUMMER AFTERNOON BY THE RIVER BANK. *Every week-end the angler can be found fishing peacefully by the banks of river and lake. Freshwater fishing with rod and line is a summer sport enjoyed all over the country by old and young.*



SUMMER LIGHTNING. *This vivid photograph reveals that the flash of forked lightning takes a wavering course branching out like the limbs of a tree. Lightning is the flash caused by the discharge of electricity between clouds or between cloud and earth.*

more carried aloft and gathers a coating of ice—a process which may be repeated several times before the hail finally falls. This happened in a storm near Northampton in 1935, when the stones were at least $1\frac{1}{2}$ inches in diameter and caused immense damage to windows and roofs over an area forty miles long by ten miles wide. Hail, unlike snow, does not provide effects of loveliness as, after contacting the warm earth, it rapidly melts. Not all hailstorms are accompanied by thunder, nor all thunderstorms by hail; and it has been known for a thunderstorm to coincide with a winter snowstorm. Winter thunder is caused by currents of very cold “polar” air becoming warmed by contact with relatively warm sea and rising rapidly through the colder air above to form

massive clouds of the type described. Winter thunderstorms occur most frequently along our northern and western seaboard, while summer storms take place chiefly in the warm inland regions.

The rain that forms in electrical storms is often described as “torrential”. A whole month’s rainfall average has been known to fall in less than an hour, and it is not uncommon for two inches of rain to fall in about half an hour. Such heavy falls frequently cause great damage and sometimes loss of life.

Apart from the danger of storm floods, there is the more immediate danger arising from the electrical nature of thunderstorms. The lightning flash which sometimes does such disastrous damage to property, and even to human life, is really a gigantic electric spark. Inside the



RAIN IN AUGUST. *Though rainfall is notoriously capricious in its quantity and the time of its fall, yet in all parts of the British Isles there is agreement that the first half of the year is less wet than the last six months. Summer rain is a refresher.*



THE SETTING SUN. *This photograph shows the rays of the setting sun striking through the low-lying clouds and throwing the trees in the foreground into sharp and dramatic relief silhouetted clearly against the red-gold brilliance of the sky.*

thunder clouds, there is a tremendous disturbance, and the powerful rising and descending air currents split up the falling raindrops, giving rise to electrical charges upon them. Ordinarily, the air acts as an insulator, but when the strain becomes greater than the air can bear, a lightning flash takes place, either from cloud to cloud, or from cloud to earth. Thunder is the *sound* of lightning travelling through the air, but if the storm is some distance away, we see the lightning before we hear the thunder, because light travels infinitely faster than sound. By timing the interval between flash and thunder-peal and allowing a mile for every five seconds, we can easily tell how far off a storm is. Incidentally, let us remember that it is very unsafe to shelter under trees during a thunder-

storm or to stand near metal fences.

With the arrival of August, summer is brought to an end. This is the month of harvest, the period of growth and development is over and from now onwards flowers diminish in numbers while seeds and fruit increase. It is the most silent of any but the winter months, most of the birds having stopped singing, except for the robin who will sometimes start his autumn song before the end of August. It is, perhaps, not such an uncertain month from a climatic point of view but even so, it can be capricious, though not to the extent that Byron so rashly states :—

“The English winter—ending in July,
To recommence in August”.

There can be great differences between the weather of one summer and that of

the following year. For instance, the "halcyon summer" of 1911 with its brightness and warmth and dryness was succeeded next year by as dull and cold a summer as it is possible to imagine. The summer of 1933 will also be remembered for its warmth though 1911 had the distinction of recording the highest temperature experienced in our islands during the last half-century—100° F. at Greenwich on 9th August.

Why must the British weather be so uncertain? It has long been a byword among those accustomed to the more dependable climates of other lands, but there is no reason to wonder at its capriciousness when we consider how close we lie to the main depression-track, which in itself is prone to vary its position. That familiar phrase, beloved of B.B.C. announcers "a depression is

centred over Iceland" sometimes prompts the query: "Why Iceland?" Broadly speaking, the reason is this. Between Iceland and Greenland there flows a cold current from the N.E. accompanied by winds from the same direction. Another cold current, streaming along the coast of Labrador south-eastward, meets the first, and in the region of this meeting of currents and winds, we find the weather is most disturbed. In fact, a depression belt lies between the St. Lawrence, Iceland and Northern Norway.

A depression can be anything up to 1,000 miles in diameter and is generally associated with bad weather. When the path of the depression lies across Iceland, we may expect a season of good weather, but on the other hand, when it moves far enough to the south to cross our

ATLANTIC ROLLERS ON A FINE EVENING. *Off the coast of Cornwall a calm sea is a rarity. Here can be seen the ocean in a kindly mood, rolling gently across the shallow sands, the perfect type of sea for surf-riding and holiday makers.*



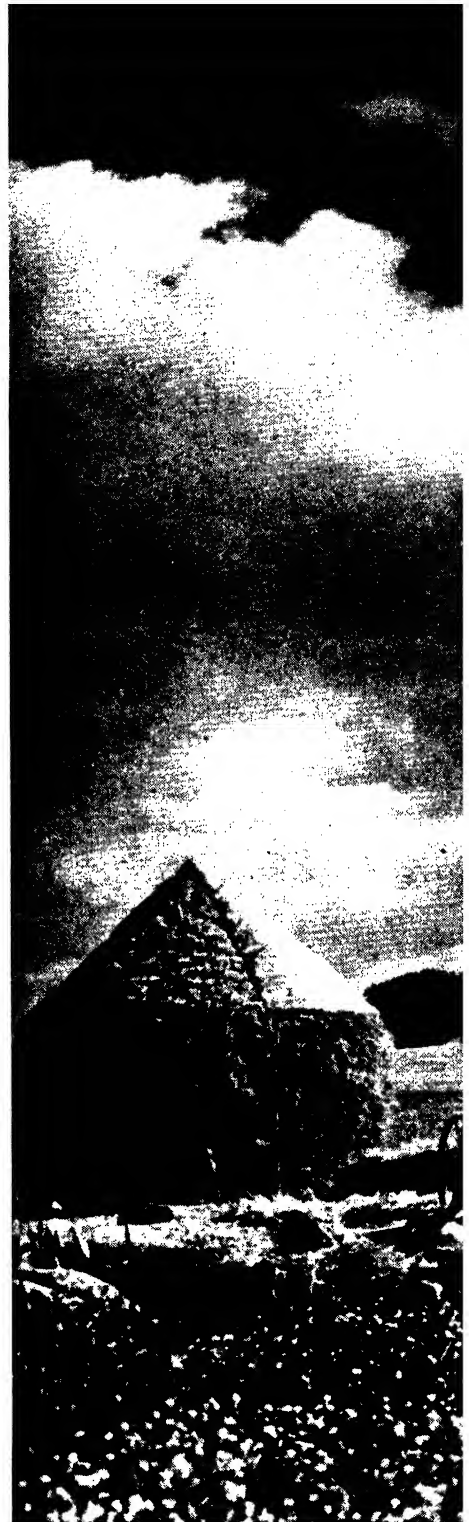
THRESHING THE CORN. *When the harvest has been gathered in, the summer is drawing to a close and autumn will be with us again in a few short weeks.*

islands, the season is likely to be bad.

The term "anticyclone" indicates the opposite condition to that of a depression. Anticyclones are areas where barometric pressure is high and winds are light. Such winds as there are travel clockwise or else fall to a calm. These anticyclones or periods of high pressure move very slowly and often remain motionless for several days. In summer, they are accompanied by very dry air, cloudless skies, dew and mist in the valleys at night, hot sun in the daytime. In winter, however, anticyclones are accompanied by frost and fog, and still weather, or at times by gloomy overcast skies, such as are seen during "black frosts."

As we have said above, the main depression track is itself prone to vary its position, and this explains such phenomena as the year 1872 being the wettest year on record—in those twelve months the country as a whole had 144 per cent. of the usual rainfall—while 1921 was the driest year, when Britain had only 70 per cent. of its normal rainfall. Strangely enough, this was the only dry year in fifteen successive years. Some of us can still recall vividly how in the summer of that year hillside and woodland were smouldering and smoking from East Scotland to the English Channel, through fires started by the sun's heat upon the dried-up vegetation. Then, again, we have years when it may be dry in one part of the kingdom and wet in another, such as 1880 when it was dry over Scotland but wet over England, and 1898 when conditions were almost the reverse.

In Charlemagne's calendar, September was called "harvest month" and in Switzerland it is still called Herbstmonat







THE FIRST FROST



SUNSHINE AND MIST. *A familiar and lovely sight on an autumn morning is the sun throwing shafts of light through the morning mist onto the fallen leaves.*

(harvest month). The Anglo-Saxons called the month Gerstmonath (barley month), that crop being usually harvested then. In this month the warm days take us gradually and unaware into autumn. Seeds and berries take the place of flowers and the birds make the most of the feasts thus provided for them, greedily devouring the purplish blue elder berries and the black berries of the privet. There are still flowers in full beauty—Michaelmas Daisies, Autumn Crocus, and Honeysuckle—and Keats' lines to Autumn are perfectly true. This gracious month does supply:—

“—still more, later flowers for the
bees,

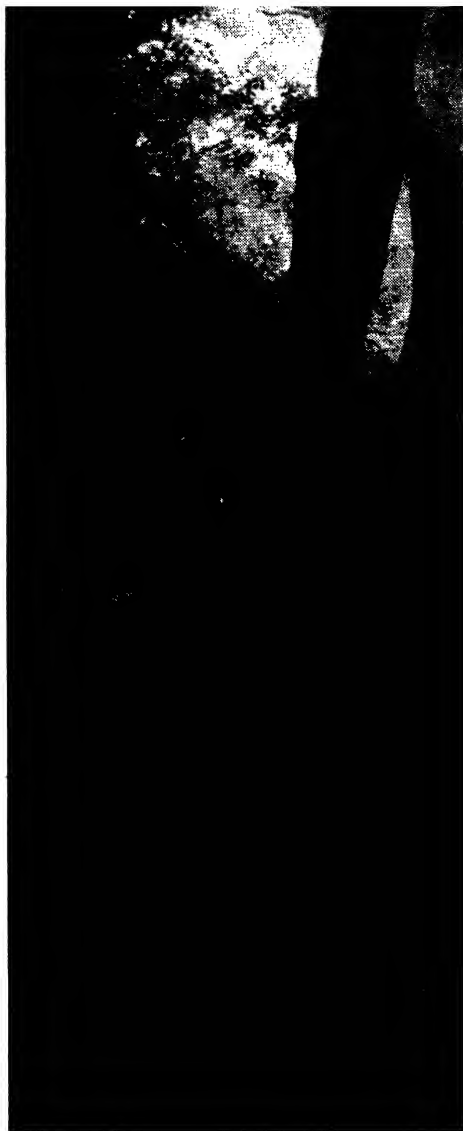
Until they think warm days will never
cease,

For Summer has o'er-brimm'd their
clammy cells”.

Nevertheless there are definite autumnal signs for those who look for them. Crops of toadstools are to be seen on fallen trees and in damp woods. We are thrilled by the flaming red and orange fruits of the spindle tree, acorns are ready to tumble from their cups, the little wild creatures, such as hedgehog and tortoise, are feeding up and getting fat, ready for their long winter sleep, while the squirrel is feverishly hoarding nuts in readiness for the coming season.

Autumn Splendours

September is really one of the most colourful months of the year and has much beauty and interest to offer those who take pleasure in weather-watching. The crisp splendour of a September morning, when the earth is floodlit with golden light and every snare of the garden spider is hung with tiny pearls,



legacy of the preceding night's touch of frost, cannot be exceeded in its exhilarating loveliness; while October evenings produce in general more magnificent sunset effects than any other month does. Then an after-tea-time walk in the rapidly fading light culminates in a sight of the western skies aflame with crimson, staining the sunset clouds in a multitude of ruby tints that no painter can match.



The leaves on the silver maple turn bright yellow in October, while the field maples are masses of gold and orange. Most beautiful of all trees, the beech burns with colour while the oaks deck themselves in many shades. The days grow shorter and colder, nightly frosts occurring, while the daytime sunshine continues to shed warmth on the earth. Fogs become more and more frequent,

especially in mountainous districts and in places where the atmosphere is at all times laden with smoke. To the townsman, there is no beauty in a fog, but the countryman is more fortunate and can enjoy the ethereal charm of a blanket of mist at dusk, rising, it may be, out of the river and unrolling in folds over the surrounding meadows while a thin cold moon bathes the whole in a milky radiance.



HOAR FROST. *When the temperature on the ground is below freezing-point, instead of dew we get hoar-frost deposited on the grass and vegetation. This generally takes the form of tiny needles and gathers around leaves and grass like a lace-edge.*

Darker, colder, and foggier is the month of November, which has been vividly described by Thomas Hood:—

“No sun—no moon!
No morn—no noon!
No dawn—no dusk—no proper time
of day,
No warmth, no cheerfulness, no
healthful ease,
No comfortable feel in any member,
No shade, no shine, no butterflies,
no bees,
No fruit, no flowers, no leaves, no
birds—
November!”

This month was called Wind-monath (wind month) by the Anglo-Saxons, and it was the time when the fishermen drew their boats ashore and gave over fishing until next spring. The fading glory of autumn is finally extinguished and we are prepared for the advent of

December, the quietest month of the whole year. It is then that there is a brief lull in the farmer's eternal battle against time and he has a little more leisure in which to do the many odd jobs that cry out to be done during the busy seasons. Thomas Tusser, the Shakespearean minor poet, describes the situation thus:—

“Some respite to husbands the weather
may send,
But housewives' affairs have never
an end”.

Thrushes and starlings still sing occasionally, especially after the rain which follows a frost, and the flower of this month is the Christmas rose, though the red and white dead nettles also bloom.

Snow brings a beauty peculiarly its own, and if the fall is not too heavy the result is very lovely, as our illustrations demonstrate. When the air is still and

FROST PATTERN. *These two pictures show the beautiful patterns to be found during a heavy frost. The feathery foliage shown on the right is frost flowers on a window pane. These vary considerably and every kind of delicate floral and fern pattern can be found under the right conditions.*

The lower picture shows how similar in effect are the rime-edged leaves of the lupin. Millions of tiny glittering crystals outline each leaf and reflect the light from every possible angle turning the familiar plant into a sparkling patterned stranger in our flowerless gardens.



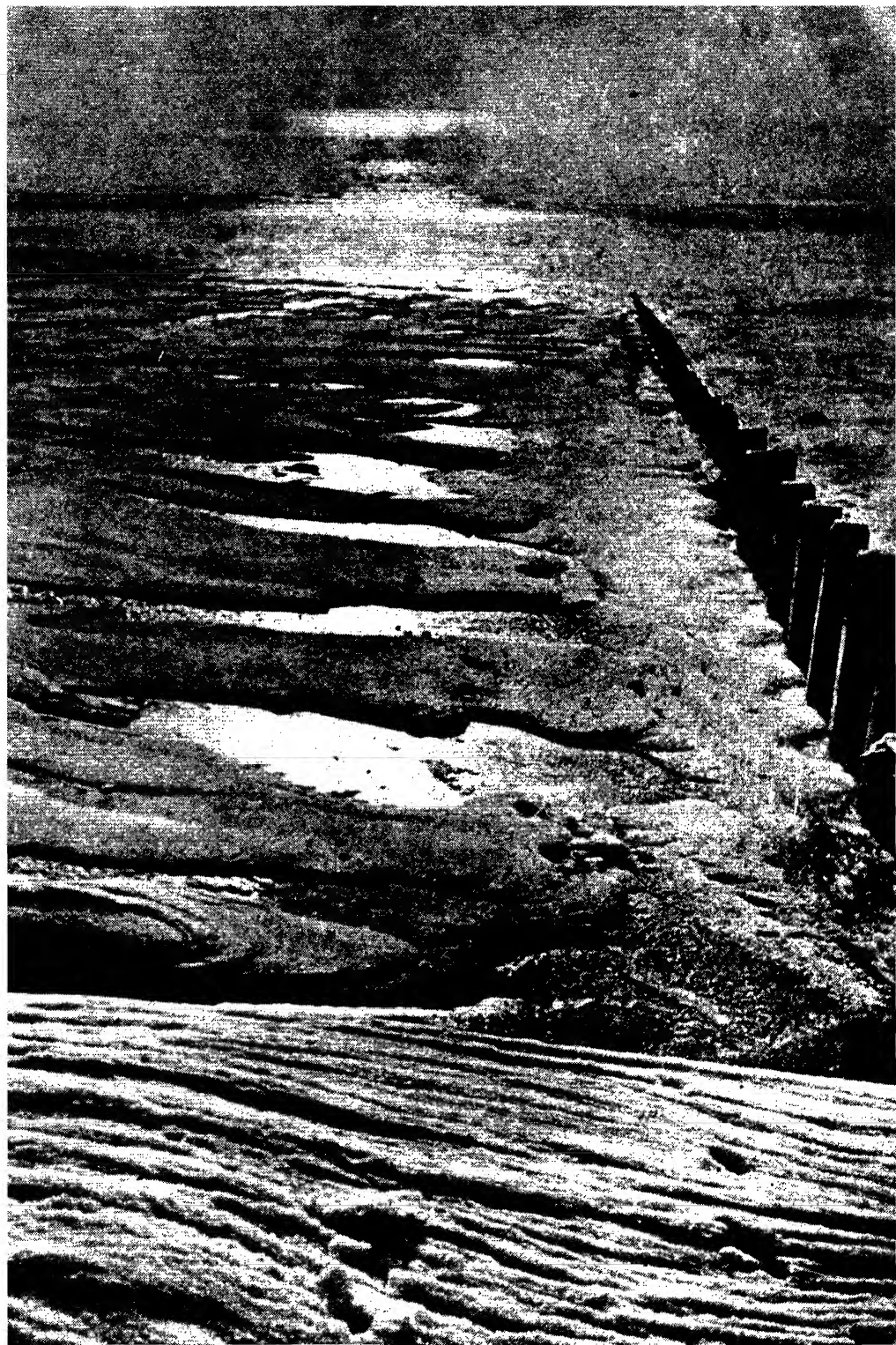
FROZEN SEA. *This picture of frozen foam was taken near a Sussex coast town during an exceptionally cold winter.*

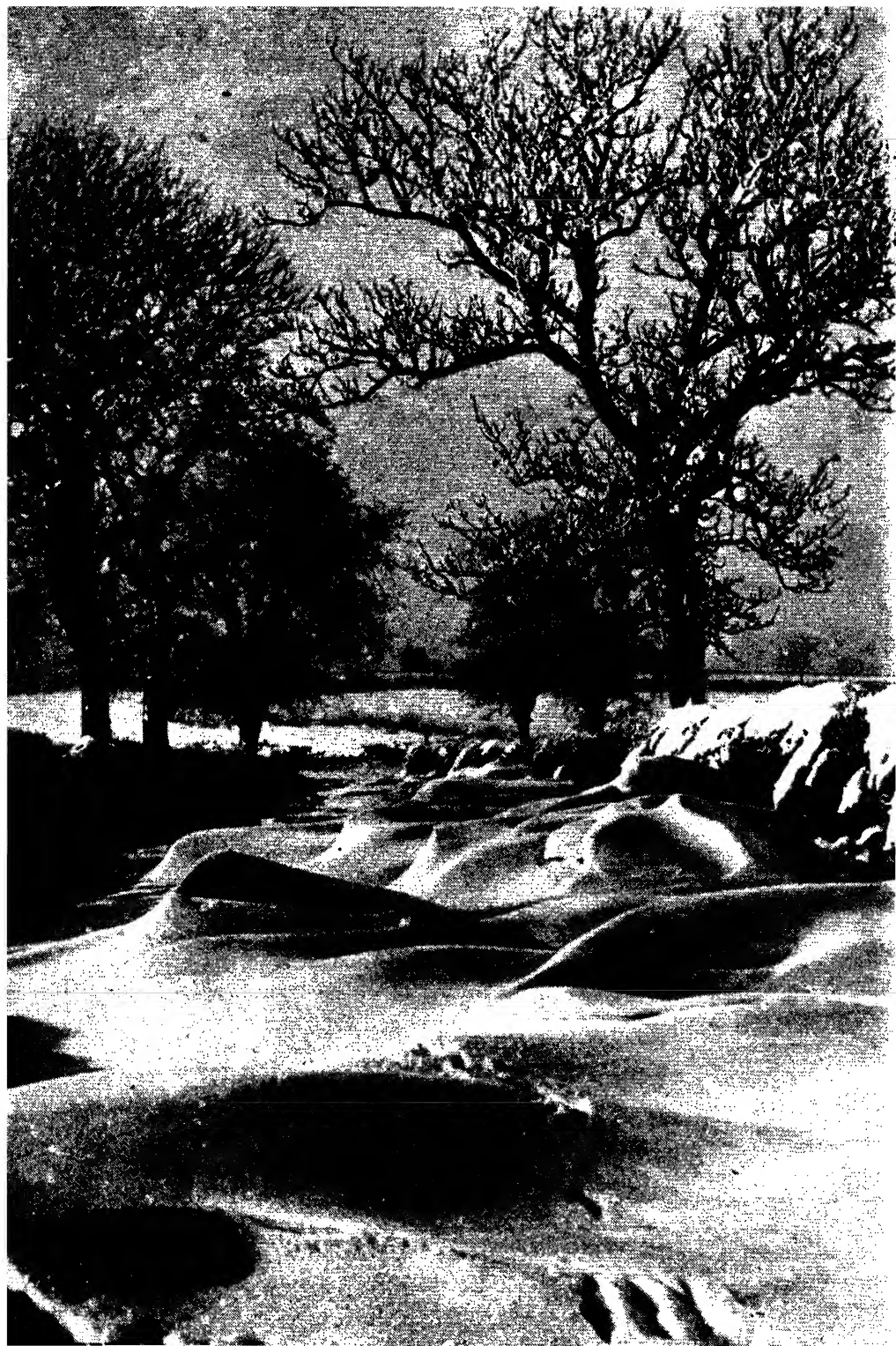
the snow falls gently, the branches and twigs on every tree are traced out in purest white and are delineated in fairylike relief against the leaden grey of the winter sky. Still more beautiful do they appear when seen in the golden light of a winter afternoon, but most striking of all in the rosy light of sunset when the trees cast their long blue shadows across the rose-tinted snow. In mountain regions, where snow is present on the peaks even though it has forsaken the valleys, the peaks assume an ethereal aspect far surpassing their summer loveliness, as for example when some mountain rears its gilded summit, pale and unsubstantial looking, out of the haze below.

When the wind blows strongly and the powdery flakes are whirled about in eddying confusion, beauty is still retained in the poetry of their motion, but some of the storm's after-effects are not so good. Communications may be seriously held up for example. When the old-fashioned type of winter, with long-continued snow-fall in the months of January and February, occurred again in the years 1940, 1941 and 1942 after a lapse of sixty years, snow lay to depths of one to two feet on the level and up to eighteen feet in drifts.

It is not only when seen in bulk that snow can be an object of beauty. Take a softly-falling flake—a large loose one preferably—and examine it carefully; it will be seen to consist of a mass of tiny snow-crystals, about one-sixteenth of an inch in diameter, loosely held together, and having a star-like appearance. Provided the temperature of the air is below freezing-point it is possible to catch single snow-crystals on a piece of black velvet (the best background)







and either to examine them through a magnifier or to photograph them through a microscope; when the eye will be rewarded by a series of the loveliest six-rayed figures it is possible to imagine. It is said that a design has never been repeated, though the crystals have been photographed in thousands.

When the temperature on the ground is below freezing-point, we get hoar-frost on the grass and low-lying vegetation, instead of dew, and this can provide us with some beautiful effects also. Hoar-frost generally assumes the form of tiny white needles and gathers chiefly round the edges of blades of grass or the leaves of plants, giving them a very lace-like appearance. A somewhat similar effect is produced by rime on wooden fences and iron railings and walls when, after a prolonged spell of frost, a sudden change takes place in the weather, and a period of fog supervenes. The fog is frozen on the surfaces which are already below freezing-point and the same needle-like appearance is produced.

The lovely frost-patterns seen on window-panes are perhaps the most wonderful of all the effects due to frost: their variety is inexhaustible, palm-leaf and fern-frond, feather and whorl, and all kinds of intricate tracery are to be seen. They are due simply to the slow circulation of air within the room, where the air is always warmer and moister

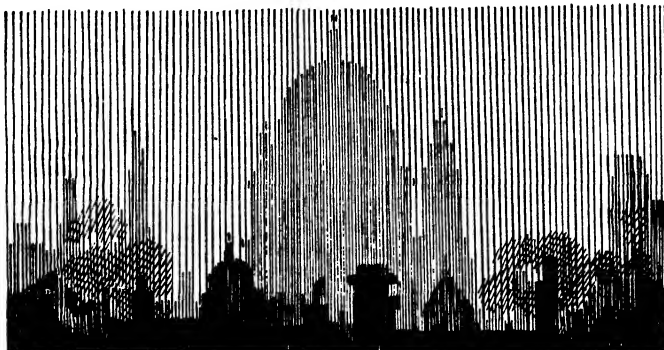
than the air outside at first. But as it freezes outside, the air in contact with the window-pane becomes gradually chilled, and becoming thus colder and therefore heavier than the rest of the air in the room, it begins to trickle slowly down the window-pane in little eddies, its moisture condensing gradually and freezing on the window in patterns influenced by the eddy itself.

Excessively cold winter weather with little or no snow but with severe frosts occurs during a winter anticyclone. Such a "black frost" following a period of snow, occurred in January and February, 1895, when the lowest temperature ever recorded in our islands was registered at Braemar, 17° below zero, or 49° below freezing-point. On the same day, 11° below zero was recorded even at Buxton, showing how widespread was the cold.

And so, even though we may at times have a more inclement winter than usual, or a sudden and unexpected frost in springtime may wreak havoc upon blossom and early crop, we must accept the snow, the rain, and the wind as they come, and remember that King Arthur's
 "... island-valley of Avilion,

Where falls not hail, or rain, or any snow,

Nor ever wind blows loudly; . . ." would, despite its romantic description, be in reality a waste like the Sahara.



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